

HOWARD COMMUNITY COLLEGE STREAM RESTORATION PROJECT

GENERAL INFORMATION

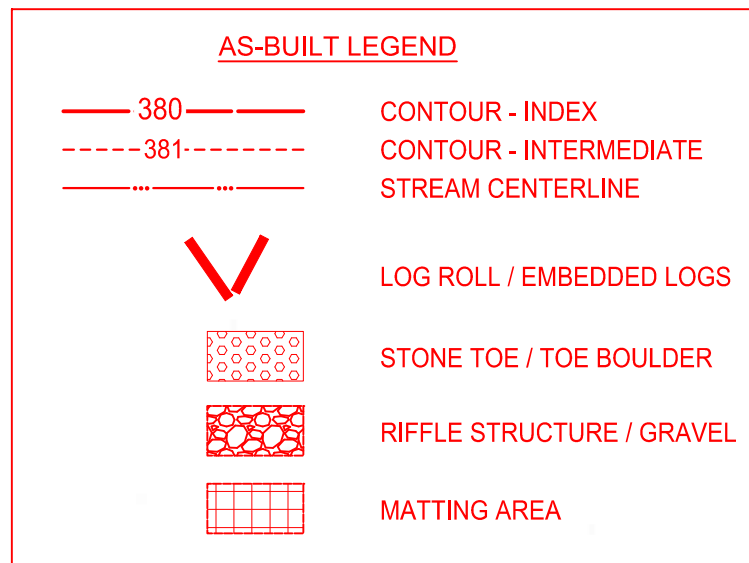
1. THE SUBJECT PROPERTIES ARE ZONED "POR" AND "NT" IN ACCORDANCE WITH THE OCTOBER 6, 2013 COMPREHENSIVE ZONING REGULATIONS.
2. THE DEPARTMENT OF PLANNING AND ZONING AND THE HOWARD SOIL CONSERVATION DISTRICT HAVE DETERMINED THAT THE DISTURBANCES WITHIN THE 100-YEAR FLOODPLAIN, WETLANDS, STREAM AND REQUIRED BUFFERS FOR THE PROPOSED STREAM RESTORATION PROJECT ARE CONSIDERED ESSENTIAL OR NECESSARY IN ACCORDANCE WITH SECTIONS 16.115(C) AND 16.116(C) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
3. THIS PROJECT IS NOT A SUBDIVISION, AND THEREFORE THIS PLAN IS NOT REQUIRED TO MEET THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
4. THERE ARE NO BURIAL GROUNDS OR CEMETERY SITES LOCATED ON THE PROJECT SITE.
5. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY CONTAINED HEREIN PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
6. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENGINEERING/ CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 24 HOURS IN ADVANCE OF ANY WORK BEING DONE.
7. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
8. THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NUMBERS 35 C2 & 29 IA WERE USED FOR THIS SITE.
9. WATER IS PUBLIC.
10. SEWER IS PUBLIC.
11. EXISTING UTILITIES ARE BASED ON FIELD SURVEYS AND AVAILABLE RECORD DRAWINGS.
12. THE WETLANDS DELINEATION FOR THIS PROJECT WAS PERFORMED BY KCI TECHNOLOGIES INC. ON JULY 22, 2013 AND JULY 24, 2013.
13. THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS PREPARED BY KCI TECHNOLOGIES, INC., IN JUNE 2013.
14. ALL WORK SHALL CONFORM TO THE MDE BEST MANAGEMENT PRACTICES FOR WETLANDS AND WATERWAYS AS LISTED IN THE REQUIREMENTS OF THE NONTIDAL WETLANDS AND WATERWAYS PERMIT APPROVED ON (MDE TRACKING #16-NT-3234/201661425).
15. NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
16. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND KCI TECHNOLOGIES, INC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND THE FIELD CONDITIONS, THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE ENGINEER, THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.
17. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
18. A WAIVER PETITION (WP-17-021) WAS APPROVED ON OCTOBER 24, 2016 FROM SECTION 16.155(G)(4)(D) MAKING THE PROJECT EXEMPT FROM AN SDP SUBMITTAL AND SECTION 16.1205(G)(7), THAT ALLOWS THE REMOVAL OF ONE SPECIMEN TREE WITHIN THE PROJECT AREA. APPROVAL OF THE WAIVER PETITION IS SUBJECT TO THE FOLLOWING CONDITIONS:
 1. THE ALTERNATIVE COMPLIANCE PLAN EXHIBIT SHALL SERVE AS THE SUBSTITUTE FOR A SITE DEVELOPMENT PLAN FOR THE PROPOSED DEVELOPMENT. NO DISTURBANCE IS PERMITTED BEYOND THE 4.22 ACRE LIMIT OF DISTURBANCE AS SHOWN ON THE PLAN EXHIBIT UNLESS IT CAN BE SUFFICIENTLY DEMONSTRATED BY THE APPLICANT TO BE JUSTIFIED.
 2. THE PROPOSED DISTURBANCE TO 0.28 ACRES OF EXISTING FOREST CONSERVATION EASEMENT SHALL BE REPLANTED ON-SITE WITHIN THE EXISTING EASEMENT PER HOWARD COUNTY RECREATION & PARKS STANDARDS.
 3. THE REMOVAL OF SPECIMEN TREE #10 (32" BLACK CHERRY) IS PERMITTED AS SHOWN ON THE PLAN EXHIBIT. THE REMOVAL OF ANY ADDITIONAL SPECIMEN TREE IS NOT PERMITTED UNDER THIS ALTERNATIVE COMPLIANCE REQUEST. ALL EFFORTS SHALL BE MADE TO REDUCE IMPACTS TO SPECIMEN TREES DURING CONSTRUCTION. TREE PROTECTION MEASURES AS DETAILED ON THE PLAN EXHIBIT SHALL BE UTILIZED AS NECESSARY.
 4. ONCE THE PROPOSED PROJECT IS COMPLETE, THE LIMIT OF DISTURBANCE SHALL BE RESTORED TO ITS PREVIOUS CONDITION THROUGH STABILIZATION AND REPLANTING OF FOREST RESOURCES.
 5. COMPLIANCE WITH THE COMMENTS FROM DPZ- DIVISION OF LAND DEVELOPMENT.
 6. THE APPLICANT SHALL OBTAIN ALL REQUIRED AUTHORIZATIONS AND PERMITS FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT AND U.S. ARMY CORPS OF ENGINEERS FOR DISTURBANCES WITHIN THE FLOODPLAIN, WETLANDS, STREAMS AND THEIR BUFFERS. REFERENCE ANY APPLICABLE MDE OR USACE PERMITS OR TRACKING NUMBERS ON THE BUILDING OR GRADING PERMITS.
19. FOREST CONSERVATION OBLIGATIONS FOR THE PORTION OF THE HOWARD COMMUNITY COLLEGE PROPERTY ZONED "POR" HAVE BEEN PREVIOUSLY ADDRESSED UNDER SDP-01-058 AND SDP-03-156. THE PORTION OF THE PROPERTY ZONED "NT" IS EXEMPT FROM FOREST CONSERVATION IN ACCORDANCE WITH SECTION 16.1202(B)(10)(v) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THEREFORE, THIS PROJECT IS NOT REQUIRED TO ADDRESS FOREST CONSERVATION.
20. THE UNNAMED TRIBUTARIES TO THE LITTLE PATUXENT RIVER ARE NOT TIER 2 WATERWAYS. ACCORDING TO THE MD303d LIST, THE LITTLE PATUXENT RIVER IS CURRENTLY IMPAIRED FOR CHLORIDES. THE LITTLE PATUXENT RIVER IS LISTED AS CATEGORY 4c, TMDL COMPLETED, FOR TOTAL SUSPENDED SOLIDS AND PHOSPHORUS.
21. THE PROJECT IS WITHIN THE HOWARD COMMUNITY COLLEGE PROPERTY, AND IS OWNED BY THE BOARD OF TRUSTEES, HOWARD COMMUNITY COLLEGE.

SPECIAL CONTRACTOR NOTES

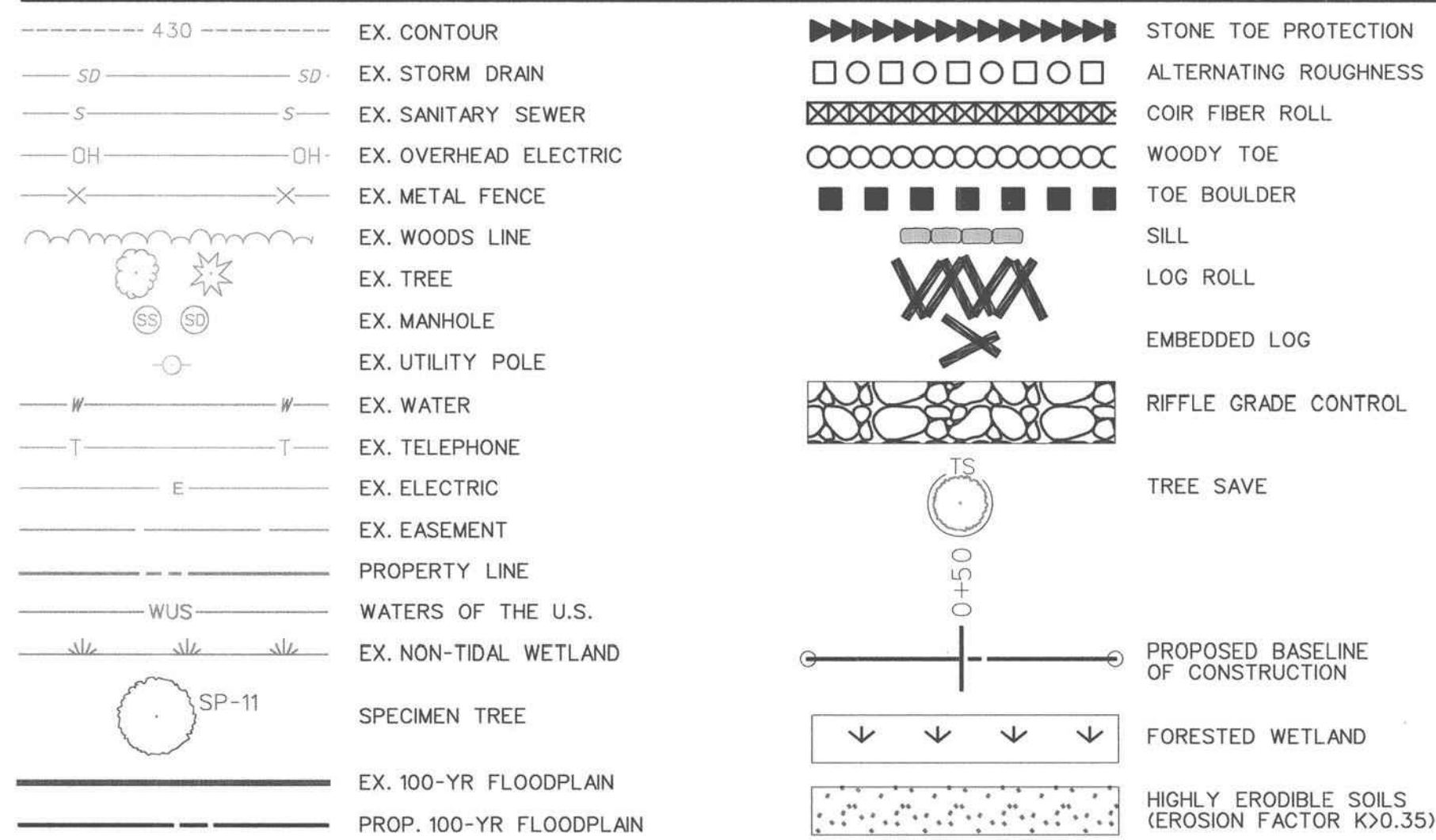
1. 100-YEAR FLOODPLAIN LIMIT IS GRAPHICALLY SHOWN ON THE PLANS.
2. NO STOCKPILE OF ANY MATERIAL IS ALLOWED IN THE 100-YEAR FLOODPLAIN.
3. IN-STREAM WORK IS PROHIBITED FROM MARCH 1 TO MAY 31, INCLUSIVE. STREAM CLASSIFICATIONS: USE IV
4. CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
5. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND-FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN AT THE CONSTRUCTION SITE. ALL EARTH CUTS AND ACTIVITIES IN THE VICINITY OF TREES TO REMAIN SHALL BE MADE IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE WITHIN THE DRILLPIE OF THE TREE. PROTECTIVE ORANGE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE CRITICAL ROOT ZONE PRIOR TO CONSTRUCTION. THE LOCATION OF THE PROTECTIVE ORANGE FENCING SHALL BE APPROVED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS PRIOR TO CONSTRUCTION.
6. CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS.
7. UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
8. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.
9. ALL TREES TO BE REMOVED SHALL BE CUT AT THE BASE WITH A SAW AND NOT PUSHED OVER. TREE STUMPS MAY BE LEFT IN PLACE, UNLESS OTHERWISE DIRECTED ON THE PLANS.
10. ALL MATERIAL SHALL BE REMOVED AND DISPOSED OFFSITE.
11. THE CONTRACTOR SHALL PAY CLOSE ATTENTION TO PEDESTRIANS WALKING NEAR THE WORK SITE.
12. WORKING HOURS ARE 7AM TO 7PM MONDAY THROUGH FRIDAY.
13. THE CONTRACTOR SHALL AVOID TRACKING HEAVY EQUIPMENT OVER THE CRITICAL ROOT ZONE OF SPECIMEN TREES. IF UNAVOIDABLE, LOAD MATS SHOULD BE USED WHEN TRACKING OVER THE CRITICAL ROOT ZONES.
14. WORK AREAS SHALL BE PERMANENTLY STABILIZED DAILY BEFORE LEAVING THE WORK SITE.
15. PROVIDE TEMPORARY WOOD MATS FOR CONSTRUCTION TRAFFIC THROUGH WETLAND AREAS. WOOD MATS SHALL BE REVIEWED AND APPROVED BY THE INSPECTOR AS APPLIED DURING CONSTRUCTION. ALL MATERIAL SHALL BE REMOVED UPON CONSTRUCTION COMPLETION.
16. SOIL STABILIZATION MATTING IS TO BE PLACED THROUGHOUT THE MAJORITY OF THE SITE DUE TO THE ABUNDANCE OF STEEP SLOPES AND HIGHLY ERODIBLE SOILS FOUND ON SITE. NATURAL FIBER MATTING SHALL BE PLACED THROUGHOUT THE PROJECT SITE WHERE ANY GRADING IS PERFORMED WITH THE EXCEPTION OF AREAS USING REINFORCED NATURAL FIBER MATTING AS SHOWN IN THE DETAILS. AREAS WHERE CLEARING AND GRADING ARE NOT PERFORMED (E.G., LOCATIONS OF HOSE FOR PUMP AROUND, CONSTRUCTION ACCESS, OR AREAS NOT GRADED) DO NOT REQUIRE THE APPLICATION OF SOIL STABILIZATION MATTING.

SHEET INDEX

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LEGEND



HOWARD COUNTY, MARYLAND DEPARTMENT OF PUBLIC WORKS CAPITAL PROJECT NUMBER D-1158



VICINITY MAP
SCALE: 1" = 2000'
ADC MAP COORD. 4934/K6

DESIGNATION	PID	NORTHING	EASTING	ELEVATION
35 C2	N/A	563,920.835	1,344,204.120	463.40
29 IA	N/A	568,986.073	1,343,640.108	482.04

HORIZ NAD 83/91
VERT NAVD 88

ENGINEER'S CERTIFICATE
"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT"

Kathy L. Overman P.E. # 38311 DATE 11/2/16
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE)
KATHY L. OVERMAN, PE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE THE BEGINNING OF THE PROJECT. I/ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT"

Holger Seung DATE 12-8-16
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE)

NOTE:
The field work for this stream as-built was performed on Feb. 1 - 20, 2017.

SURVEYOR'S CERTIFICATION

I hereby certify that this As-Built Survey is an accurate representation of the locations and elevations in the field as of 02 / 20 / 2017.

James H. Hunt 21106 Reg. No. Date

NOTE: A Licensed Professional Land Surveyor either personally prepared or was in responsible charge over the preparation of this drawing and the surveying work reflected in it, all in compliance with the requirements set forth in Regulation 12 of the Minimum Standards of Practice.

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD	
<i>Holger Seung</i> DIRECTOR OF PUBLIC WORKS DATE 12-8-16	<i>Mark S. Richmond</i> CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE 12/6/16
<i>Robert M. Mather</i> COLLEGE PRESIDENT DATE 12/8/16	<i>Environmental Health & Safety Supervisor</i> DATE 12/8/16

PERMIT INFORMATION CHART					
SUBDIVISION NAME	0000	SECTION/AREA	PARCEL#	47, 81 (LOTS A-1-A-4)	
PLAT* or L/V	GRID *	ZONING	TAX MAP NO.	ELECT. DIST.	CENSUS TRACT
18178, 23152	0006	POR, NT	35, 36	05	602202
WATER CODE	PUBLIC				
SEWER CODE	PUBLIC				
THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.					
OWNER: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS 6751 COLUMBIA GATEWAY DRIVE COLUMBIA, MD 21046 410-313-6444			DATE: 11/2/16		

GEORGE WILLIAM STEPHENS, JR. and ASSOCIATES, INC.
ENGINEERS-PLANNERS-SURVEYORS-TRANSPORTATION
402 MILLENNIUM DRIVE, SUITE 100
BELCAMP, MARYLAND 20707
Phone: (410) 297-2340 gstephens.com Fax: (410) 297-2345



NO.	REVISIONS DESCRIPTION	DATE
1	AS-BUILT DRAWING	03/09/17

936 RIDGEBROOK ROAD
SPARKS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com



HOWARD COMMUNITY COLLEGE
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 47, 81 TAX MAP 35, 36
ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

TITLE SHEET
AS-BUILT

SCALE:	AS SHOWN
DATE:	NOVEMBER 2016
KCI JOB NO.:	17133314-83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	
TITLE SHEET	TI-01
SHEET NO.:	1 OF 36

AS-BUILT LEGEND

	380	CONTOUR - INDEX
	381	CONTOUR - INTERMEDIATE
		STREAM CENTERLINE
		LOG ROLL / EMBEDDED LOGS
		STONE TOE / TOE BOULDER
		RIFFLE STRUCTURE / GRAVEL
		MATTING AREA

RIFFLE GRADE CONTROL

FROM STATION	TO STATION
1+02	1+27
1+57	1+75

STONE TOE PROTECTION

FROM STATION	TO STATION	OFFSET
1+02	1+27	R/L

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

ALTERNATING ROUGHNESS

FROM STATION	TO STATION	OFFSET
1+27	1+57	L
1+75	2+07	R
2+07	2+67	L
2+67	3+00	R
3+06	3+40	L

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

COIR FIBER ROLL

FROM STATION	TO STATION	OFFSET
2+07	2+67	R
3+00	3+06	R/L
3+45	4+26	R
3+75	4+29	L

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

EMBEDDED LOG

STATION
2+20
2+49
3+87
4+15

N563800
E1346600

EXISTING AND PROPOSED 100 - YEAR FLOODPLAIN

CONTRACTOR SHOULD AVOID IMPACTS TO THE BRIDGE STABILITY WITH THE INSTALLATION OF THE STONE TOE AND RIFFLE GRADE CONTROL. ANY DAMAGE TO THE FOOTBRIDGE IS THE RESPONSIBILITY OF THE CONTRACTOR.

TAX MAP 35 PARCEL 47
PLAT NO. 19049
BULK PARCEL 'B'
"HOWARD COMMUNITY COLLEGE,
BULK PARCELS 'A' & 'B'"

ADJUST ALTERNATING ROUGHNESS TO ACCOMMODATE OVERLAND DRAINAGE

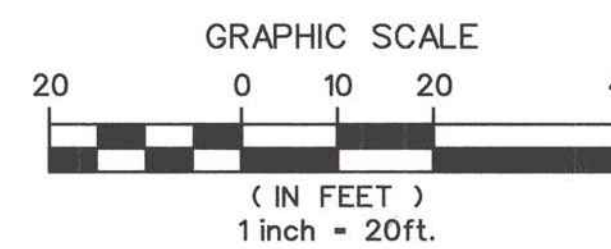
FLUSH CUT CHERRY TREE AS NEEDED FOR CONSTRUCTION ACCESS. DO NOT LIMBUP TREES.

REMOVE BOULDERS AS NEEDED FOR INSTALLATION OF THE SCE. STOCKPILE ALL BOULDERS FOR REUSE AS-DIRECTED.

PLACE RIFFLE GRADE MATERIAL AND CLASS I RIPRAP TO ADDRESS EROSION FROM CURB CUT AS DIRECTED BY ENGINEER, APPROXIMATELY 5 LF.

CONTRACTOR GRADE AND STABILIZE SMALL OUTFALL CHANNELS WITHIN THE CURRENT CHANNEL FOOTPRINT WITH CHANNEL BED MATERIAL AS DIRECTED BY THE ENGINEER

GEORGE WILLIAM STEPHENS, JR. and ASSOCIATES, INC.
ENGINEERS - PLANNERS - SURVEYORS - TRANSPORTATION
4692 MILLENNIUM DRIVE, SUITE 100
BELCAMP, MARYLAND 21017
Phone: (410) 297-2340 gws@stephens.com Fax: (410) 297-2345



LEGEND

	4.30	EX. CONTOUR		LOG ROLL
	SD	EX. STORM DRAIN		STONE TOE PROTECTION
	S	EX. SANITARY SEWER		ALTERNATING ROUGHNESS
	OH	EX. OVERHEAD ELECTRIC		COIR FIBER ROLL
	X	EX. METAL FENCE		WOODY TOE
	W	EX. WOODS LINE		TOE BOULDER
	T	EX. TREE		SILL
	M	EX. MANHOLE		LOG ROLL
	U	EX. UTILITY POLE		EMBEDDED LOG
	W	EX. WATER		RIFFLE GRADE CONTROL
	E	EX. TELEPHONE		TREE SAVE
	E	EX. ELECTRIC		PROPOSED BASELINE OF CONSTRUCTION
	E	EX. EASEMENT		
	W	PROPERTY LINE		
	W	WATERS OF THE U.S.		
	W	EX. NON-TIDAL WETLAND		
	W	EX. 100-YR FLOODPLAIN		
	W	PROP. 100-YR FLOODPLAIN		

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311. EXPIRATION DATE: JANUARY 06, 2018.

Handwritten signature and date: 12/6/16

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

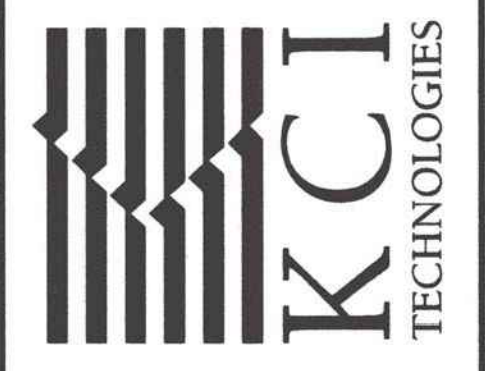
NO. 1

REVISIONS DESCRIPTION

AS-BUILT DRAWING

DATE 03/09/17

936 RIDGEBROOK ROAD
SPARKS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci.com



HOWARD COMMUNITY COLLEGE
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 47, 81 TAX MAP 35, 36
ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

GRADING PLAN AS-BUILT

SCALE: 1" = 20'

DATE: NOVEMBER 2016

KCI JOB NO.: 17133314.83

CAPITAL PROJECT NO.: D-1158

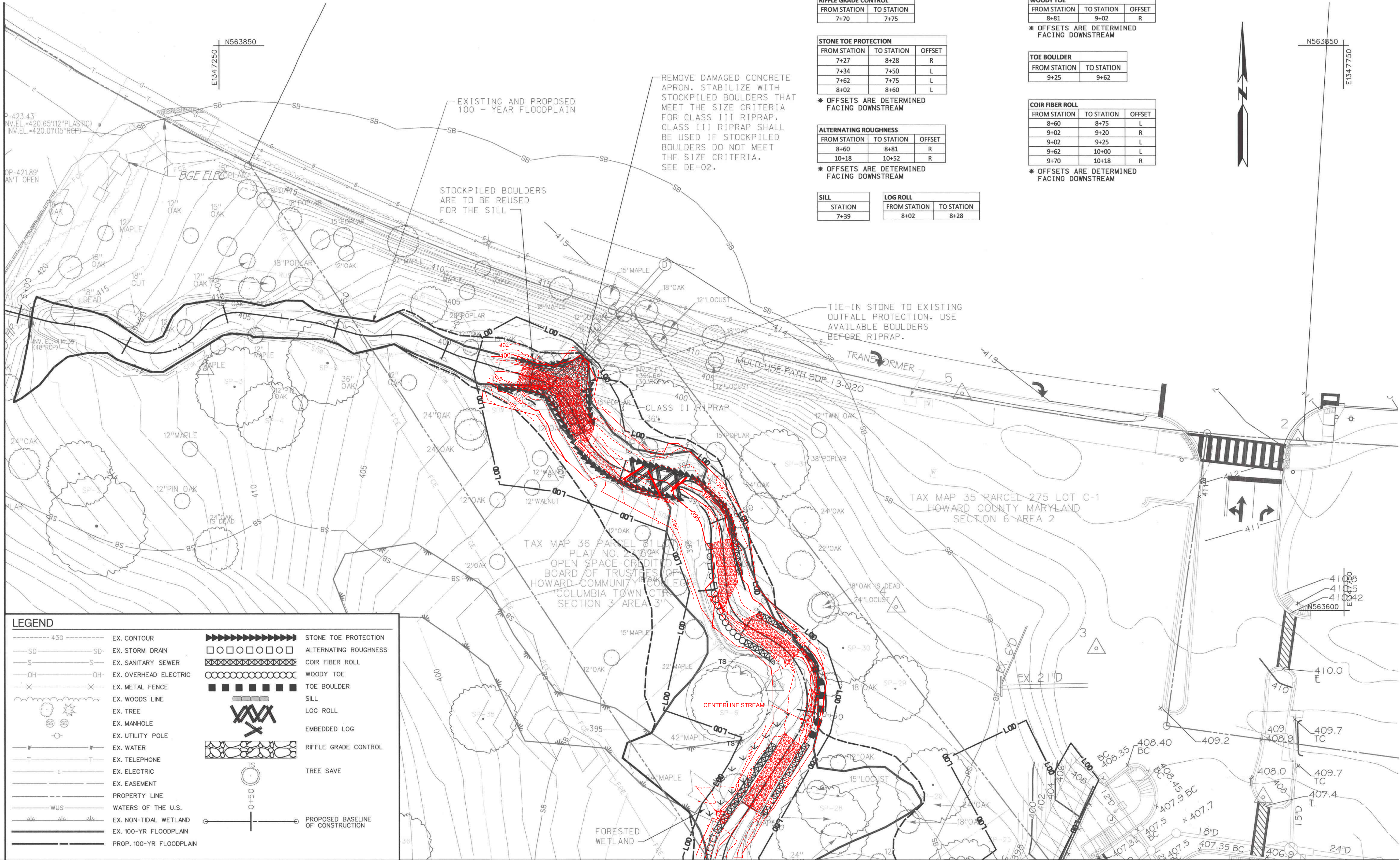
PERMIT ISSUE:

CONSTRUCTION ISSUE:

PS-01

SHEET NO.: 7 OF 36

MATCH LINE - SEE SHEET PS-01



LEGEND

--- 430 ---	EX. CONTOUR	██████████	STONE TOE PROTECTION
--- SD ---	EX. STORM DRAIN	□□□□□□	ALTERNATING ROUGHNESS
--- S ---	EX. SANITARY SEWER	▨▨▨▨▨▨	COIR FIBER ROLL
--- OH ---	EX. OVERHEAD ELECTRIC	○○○○○○○○	WOODY TOE
--- X ---	EX. METAL FENCE	■ ■ ■ ■ ■ ■	TOE BOULDER
---	EX. WOODS LINE	---	SILL
---	EX. TREE	---	LOG ROLL
---	EX. MANHOLE	---	EMBEDDED LOG
---	EX. UTILITY POLE	---	RIFFLE GRADE CONTROL
---	EX. WATER	---	TREE SAVE
---	EX. TELEPHONE	---	PROPOSED BASELINE OF CONSTRUCTION
---	EX. ELECTRIC	---	
---	EX. EASEMENT	---	
---	PROPERTY LINE	---	
---	WATERS OF THE U.S.	---	
---	EX. NON-TIDAL WETLAND	---	
---	EX. 100-YR FLOODPLAIN	---	
---	PROP. 100-YR FLOODPLAIN	---	

RIFFLE GRADE CONTROL		
FROM STATION	TO STATION	
7+70	7+75	

STONE TOE PROTECTION		
FROM STATION	TO STATION	OFFSET
7+27	8+28	R
7+34	7+50	L
7+62	7+75	L
8+02	8+60	L

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

ALTERNATING ROUGHNESS		
FROM STATION	TO STATION	OFFSET
8+60	8+81	R
10+18	10+52	R

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

SILL		
STATION		
7+39		

LOG ROLL		
FROM STATION	TO STATION	
8+02	8+28	

WOODY TOE		
FROM STATION	TO STATION	OFFSET
8+81	9+02	R

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

TOE BOULDER		
FROM STATION	TO STATION	
9+25	9+62	

COIR FIBER ROLL		
FROM STATION	TO STATION	OFFSET
8+60	8+75	L
9+02	9+20	R
9+02	9+25	L
9+62	10+00	L
9+70	10+18	R

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

MATCH LINE - SEE SHEET PS-03

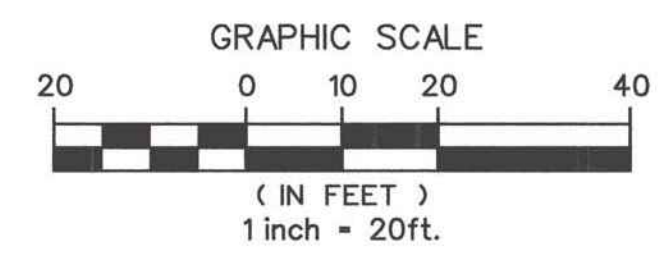
STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 No. 38311
 11/19/16

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 38311 EXPIRATION DATE: JANUARY 06, 2018

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

Chief, Bureau of Environmental Services

DATE



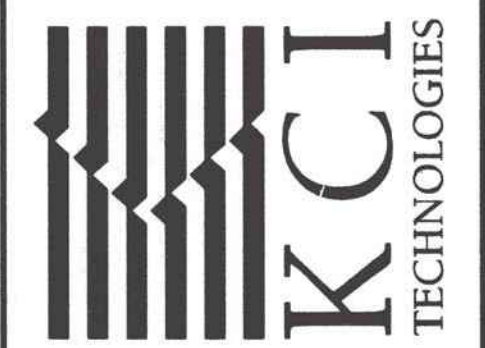
AS-BUILT LEGEND

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▨▨▨▨		RIFFLE STRUCTURE / GRAVEL
□		MATTING AREA

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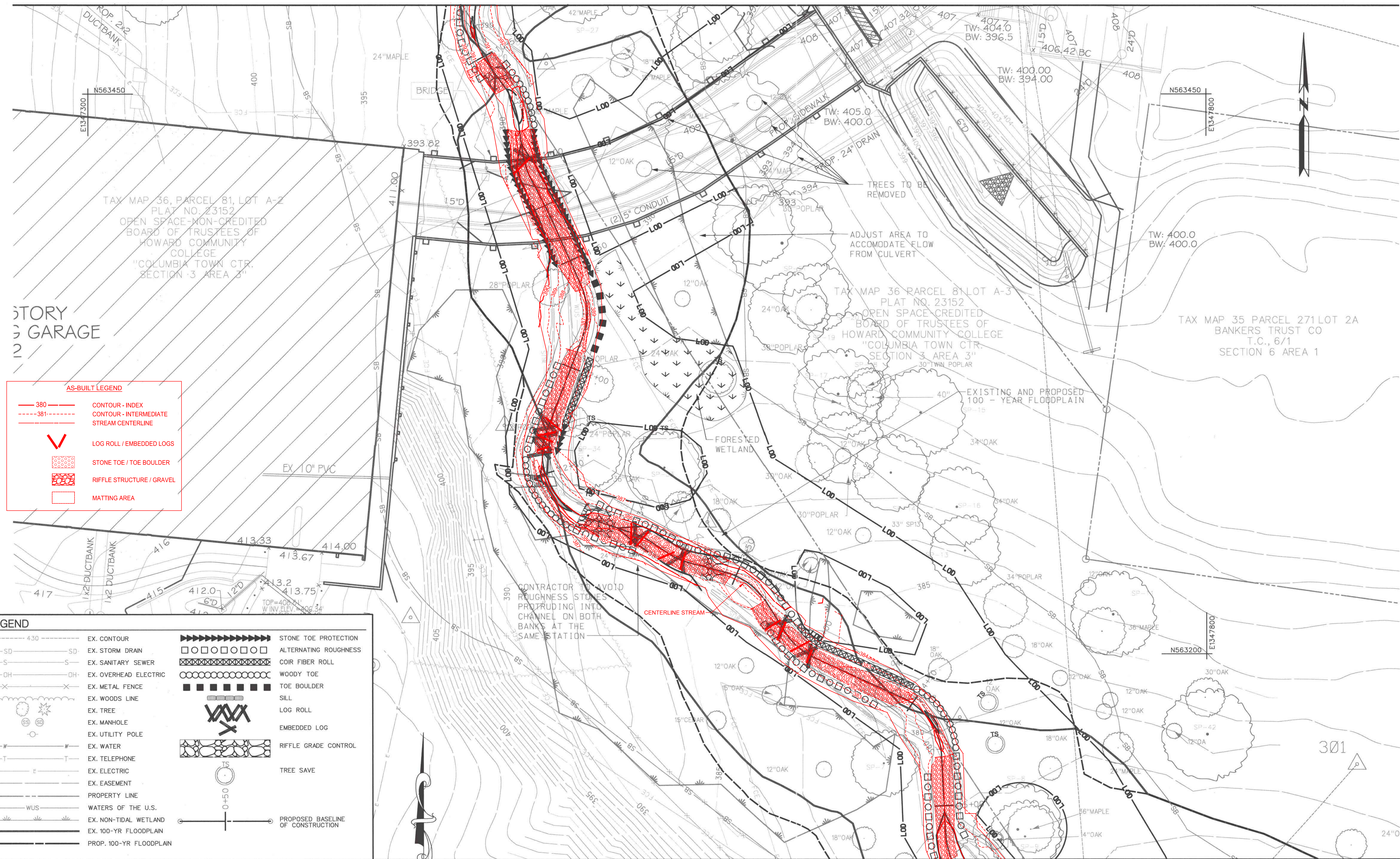
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 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 47.81 TAX MAP 35.36
 ZONING POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0005

GRADING PLAN
 AS-BUILT

SCALE:	1" = 20'
DATE:	NOVEMBER 2016
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

PS-02
 SHEET NO.: 8 OF 36

MATCH LINE - SEE SHEET PS-02



STORY
3 GARAGE
2

AS-BUILT LEGEND

---	380	CONTOUR - INDEX
---	381	CONTOUR - INTERMEDIATE
---		STREAM CENTERLINE
∨		LOG ROLL / EMBEDDED LOGS
■		STONE TOE / TOE BOULDER
■		RIFFLE STRUCTURE / GRAVEL
□		MATTING AREA

LEGEND

---	430	EX. CONTOUR	■■■■■■■■■■	STONE TOE PROTECTION
SD	SD	EX. STORM DRAIN	□□□□□□□□	ALTERNATING ROUGHNESS
S	S	EX. SANITARY SEWER	■■■■■■■■■■	COIR FIBER ROLL
OH	OH	EX. OVERHEAD ELECTRIC	○○○○○○○○○○	WOODY TOE
---	---	EX. METAL FENCE	■ ■ ■ ■ ■ ■ ■ ■	TOE BOULDER
---	---	EX. WOODS LINE	■■■■■■■■■■	SILL
---	---	EX. TREE		LOG ROLL
---	---	EX. MANHOLE		EMBEDDED LOG
---	---	EX. UTILITY POLE		RIFFLE GRADE CONTROL
---	---	EX. WATER		TREE SAVE
---	---	EX. TELEPHONE		PROPOSED BASELINE OF CONSTRUCTION
---	---	EX. ELECTRIC		
---	---	EX. EASEMENT		
---	---	PROPERTY LINE		
---	---	WATERS OF THE U.S.		
---	---	EX. NON-TIDAL WETLAND		
---	---	EX. 100-YR FLOODPLAIN		
---	---	PROP. 100-YR FLOODPLAIN		

RIFFLE GRADE CONTROL

FROM STATION	TO STATION
10+52	10+65
12+78	12+90
13+34	13+45

ALTERNATING ROUGHNESS

FROM STATION	TO STATION	OFFSET
10+18	10+52	R
10+52	10+65	L
12+00	12+40	R
12+78	13+03	R
12+81	13+85	L
13+75	14+35	R
14+77	15+15	L
14+85	15+82	R

COIR FIBER ROLL

FROM STATION	TO STATION	OFFSET
11+92	12+25	L
13+85	14+47	L

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

STONE TOE PROTECTION

FROM STATION	TO STATION	OFFSET
10+86	11+50	R
10+86	11+60	L
12+25	12+40	L

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

WOODY TOE

FROM STATION	TO STATION	OFFSET
10+65	10+86	L
12+40	12+78	R
14+47	14+77	L

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

EMBEDDED LOG

STATION
11+00
13+02
13+24
13+80
13+98

TOE BOULDER

FROM STATION	TO STATION	OFFSET
11+60	11+92	L

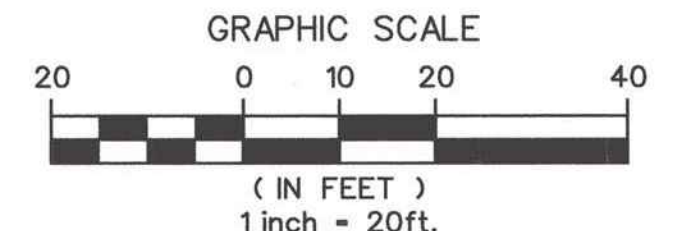
* OFFSETS ARE DETERMINED FACING DOWNSTREAM

LOG ROLL

FROM STATION	TO STATION
12+25	12+40

George William Stephens, Jr.
Professional Engineer
License No. 38311
Expiration Date: January 06, 2018

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
 Chief, Bureau of Environmental Services
 DATE: 11/6/16



MATCH LINE - SEE SHEET PS-04

NO.	REVISIONS DESCRIPTION	DATE
1	AS-BUILT DRAWING	03/09/17

936 RIDGEBROOK ROAD
 SPARKS, MARYLAND 21152
 TELEPHONE: (410) 316-7800
 FAX: (410) 316-7818
 WWW.KCI.COM

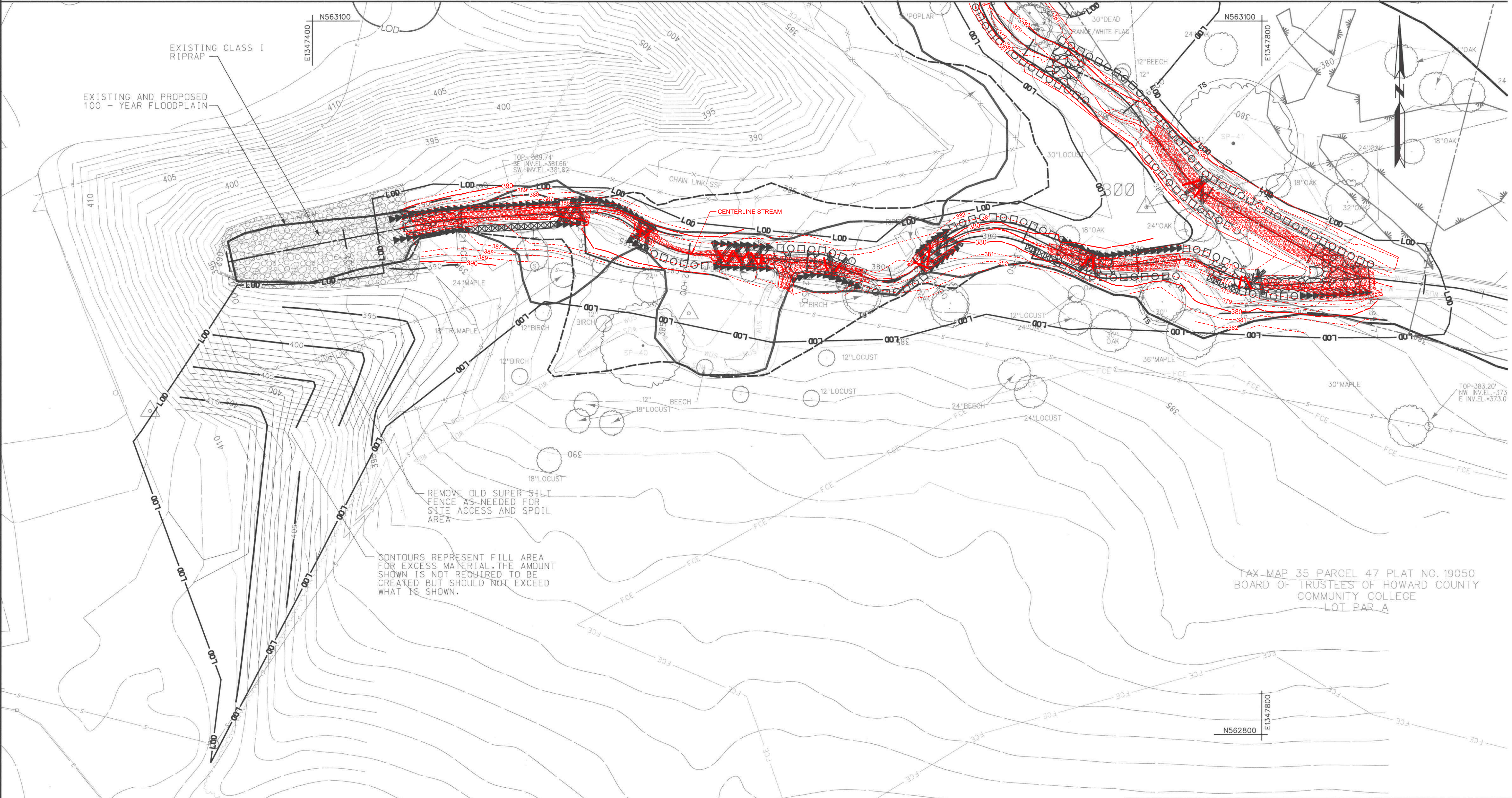


HOWARD COMMUNITY COLLEGE
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 47, 81 TAX MAP 95, 36
 ZONING POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

GRADING PLAN
 AS-BUILT

SCALE: 1" = 20'
 DATE: NOVEMBER 2016
 KCI JOB NO.: 17133314.83
 CAPITAL PROJECT NO.: D-1158
 PERMIT ISSUE:
 CONSTRUCTION ISSUE:

GEORGE WILLIAMS STEPHENS, JR. AND ASSOCIATES, INC.
 ENGINEERS - PLANNERS - SURVEYORS - TRANSPORTATION
 402 MILLENNIUM DRIVE, SUITE 100
 BELCAMP, MARYLAND 20707
 Phone: (410) 297-2340 Fax: (410) 297-2345



RIFLE GRADE CONTROL	
FROM STATION	TO STATION
15+60	15+74
17+00	17+26
20+75	21+00
22+30	22+75
23+65	23+90
24+75	24+99

STONE TOE PROTECTION		
FROM STATION	TO STATION	OFFSET
20+70	21+05	R
20+70	21+81	L
21+40	21+50	R
21+75	21+81	R
22+10	22+30	L
22+10	22+35	R
22+43	22+75	R
23+02	23+18	R/L
23+65	24+17	L
24+70	24+99	R

ALTERNATING ROUGHNESS		
FROM STATION	TO STATION	OFFSET
14+85	15+82	R
15+60	17+25	L
16+20	16+70	R
21+81	22+10	R
22+30	22+70	L
22+75	23+02	R
23+18	23+65	L
23+65	24+17	R
24+19	24+45	L
24+45	24+70	R

COIR FIBER ROLL		
FROM STATION	TO STATION	OFFSET
21+05	21+40	R
23+52	23+65	R
24+32	24+45	R

* OFFSETS ARE DETERMINED FACING DOWNSTREAM

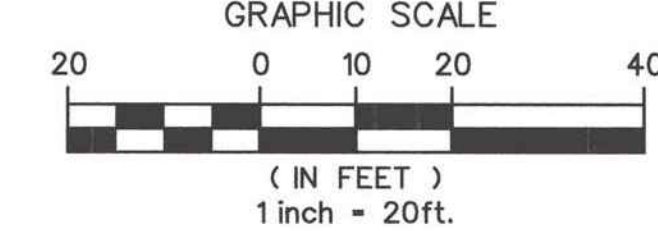
LOG ROLL		
FROM STATION	TO STATION	OFFSET
21+40	21+50	
21+75	21+81	
22+10	22+30	
23+02	23+18	

EMBEDDED LOG	
STATION	OFFSET
16+45	
22+61	
23+80	
24+52	

AS-BUILT LEGEND

- 380 --- CONTOUR - INDEX
- 381 --- CONTOUR - INTERMEDIATE
- STREAM CENTERLINE
- ✓ LOG ROLL / EMBEDDED LOGS
- STONE TOE / TOE BOULDER
- RIFLE STRUCTURE / GRAVEL
- MATTING AREA

GEORGE WILLIAM STEPHENS, JR. and ASSOCIATES, INC.
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 405 MILLENNIUM DRIVE, SUITE 100
 BELCAMP, MARYLAND 21037
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LEGEND

--- 430 ---	EX. CONTOUR	████████████████	STONE TOE PROTECTION
--- SD --- SD ---	EX. STORM DRAIN	□□□□□□□□	ALTERNATING ROUGHNESS
--- S --- S ---	EX. SANITARY SEWER	XXXXXXXXXXXX	COIR FIBER ROLL
--- OH --- OH ---	EX. OVERHEAD ELECTRIC	OOOOOOOOOO	WOODY TOE
--- X --- X ---	EX. METAL FENCE	■■■■■■■■■■	TOE BOULDER
---	EX. WOODS LINE		SILL
---	EX. TREE	XXX	LOG ROLL
---	EX. MANHOLE	--- X ---	EMBEDDED LOG
---	EX. UTILITY POLE	---	RIFLE GRADE CONTROL
---	EX. WATER	---	TREE SAVE
---	EX. TELEPHONE	---	PROPOSED BASELINE OF CONSTRUCTION
---	EX. ELECTRIC	---	
---	EX. EASEMENT	---	
---	PROPERTY LINE	---	
---	WATERS OF THE U.S.	---	
---	EX. NON-TIDAL WETLAND	---	
---	EX. 100-YR FLOODPLAIN	---	
---	PROP. 100-YR FLOODPLAIN	---	
---	FOREST CONSERVATION EASEMENT	---	

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311, EXPIRATION DATE: JANUARY 06, 2018

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

Mark D. Lucas
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

12/16/16
 DATE

NO.	REVISIONS DESCRIPTION	DATE
1	AS-BUILT DRAWING	03/09/17

936 RIDGEBROOK ROAD
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 WWW.KCI.COM

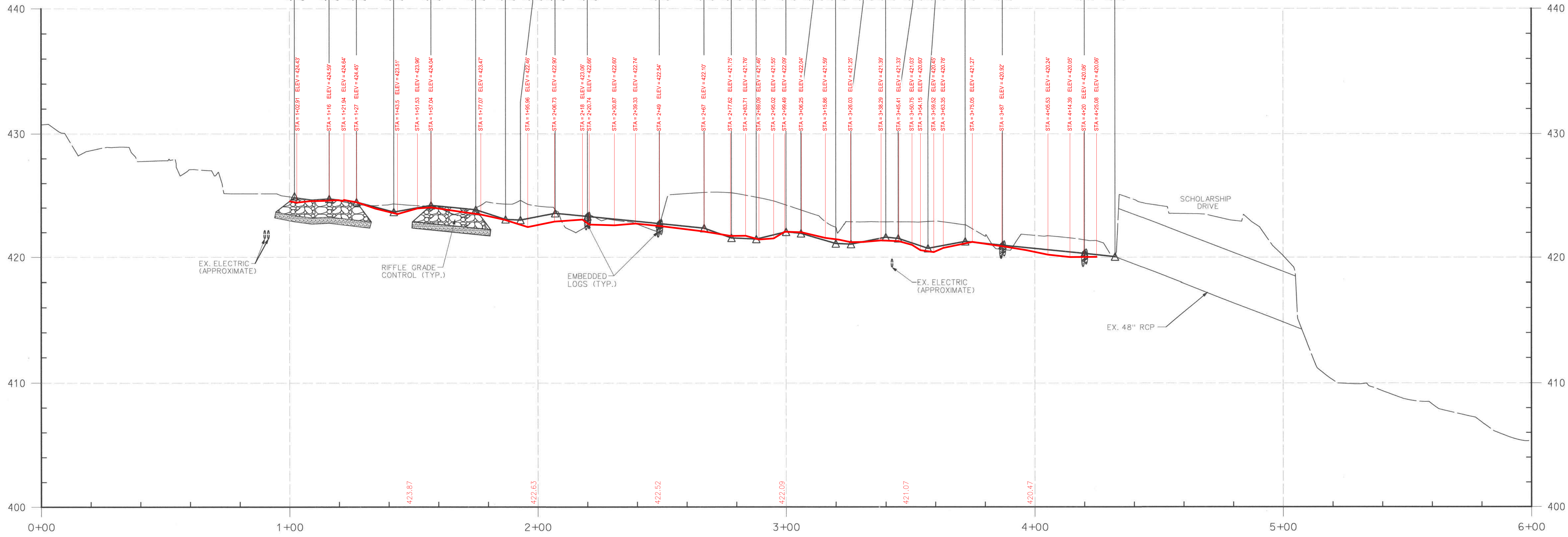


**HOWARD COMMUNITY COLLEGE
 STREAM RESTORATION PROJECT**
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 47, 81 TAX MAP 35, 36
 ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

GRADING PLAN AS-BUILT

SCALE: 1" = 20'
 DATE: NOVEMBER 2016
 KCI JOB NO.: 17133314.83
 CAPITAL PROJECT NO.: D-1158
 PERMIT ISSUE:
 CONSTRUCTION ISSUE:

PS-04
 SHEET NO.: 10 OF 36



REACH 1 PROFILE

LEGEND	
EXISTING GROUND ALONG BASELINE	-----
PROPOSED GRADE ALONG BASELINE	—————

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311, EXPIRATION DATE: JANUARY 06, 2018.

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
 Chief, Bureau of Environmental Services
 Date: 12/6/16

GEORGE WILLIAM STEPHENS, JR. and ASSOCIATES, INC.
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NO.	REVISIONS DESCRIPTION	DATE
1	AS-BUILT DRAWING	03 / 09 / 17

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HOWARD COMMUNITY COLLEGE
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 47, 81 TAX MAP 35, 36
 ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

PROFILE
 AS-BUILT

SCALE: HOR. 1" = 20'
 VERT. 1" = 4'

DATE: NOVEMBER 2016

KCI JOB NO.: 17133314.83

CAPITAL PROJECT NO.: D-1158

PERMIT ISSUE:

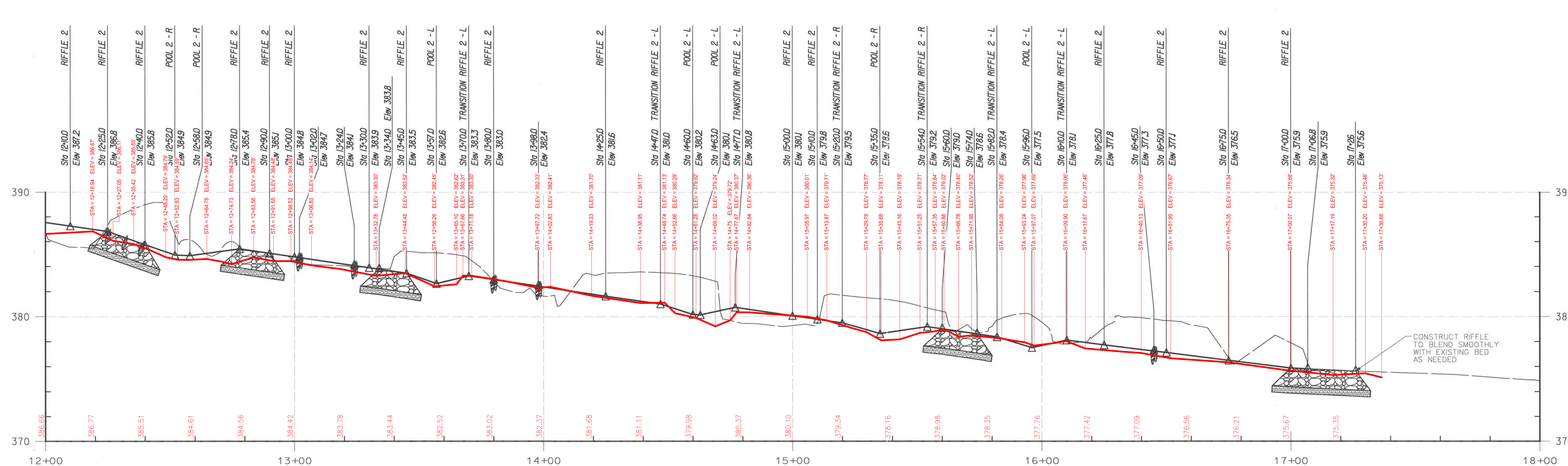
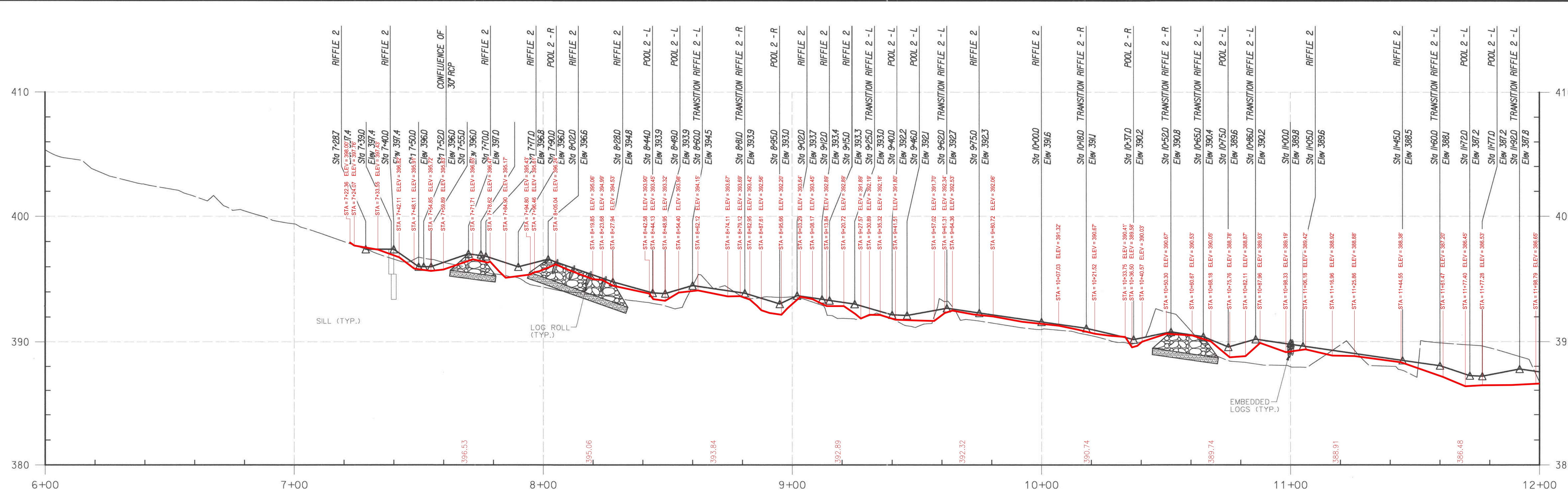
CONSTRUCTION ISSUE:

PR-01

SHEET NO.: 15 OF 36

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LEGEND

EXISTING GROUND ALONG BASELINE	---
PROPOSED GRADE ALONG BASELINE	—

REACH 2 PROFILE

Kathy J. [Signature]
 PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311, EXPIRATION DATE: JANUARY 06, 2018

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD
[Signature]
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
 DATE: 12/6/16

GEORGE WILLIAM STEPHENS, JR. and ASSOCIATES, INC.
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 BELCAMP, MARYLAND 21017
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NO.	REVISIONS DESCRIPTION	DATE
1	AS-BUILT DRAWING	03/09/17

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**HOWARD COMMUNITY COLLEGE
 STREAM RESTORATION PROJECT**
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 47, 81 TAX MAP 35.36
 ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

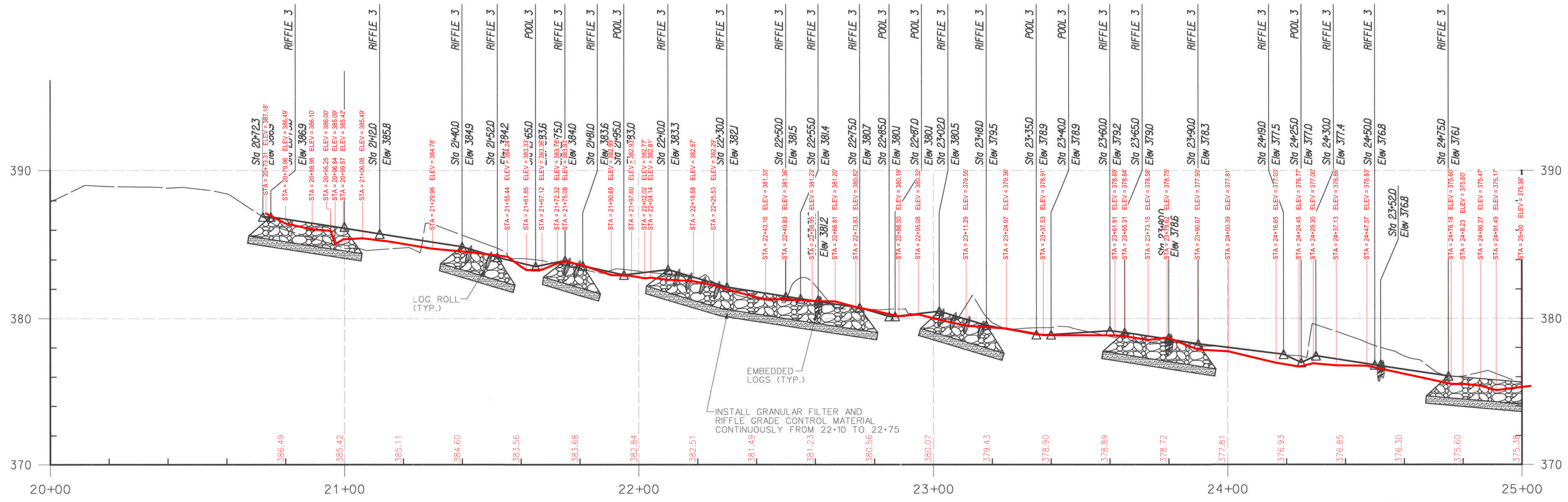
**PROFILE
 AS-BUILT**

SCALE:	HOR. 1" = 20'
	VERT. 1" = 4'
DATE:	NOVEMBER 2016
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

PR-02
 SHEET NO.: 16 OF 36

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REACH 3 PROFILE

LEGEND	
EXISTING GROUND ALONG BASELINE	---
PROPOSED GRADE ALONG BASELINE	—

Kathy A. Hovind

 PROFESSIONAL ENGINEER

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
 DATE: 12/16/16

GEORGE WILLIAM STEPHENS, JR. and ASSOCIATES, INC.
 ENGINEERS-PLANNERS-SURVEYORS-TRANSPORTATION
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NO.	REVISIONS DESCRIPTION	DATE
1	AS-BUILT DRAWING	03/09/17

KCI TECHNOLOGIES
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 FAX: (410) 316-7818
 www.kci.com

**HOWARD COMMUNITY COLLEGE
 STREAM RESTORATION PROJECT**
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 47, 81 TAX MAP 35, 36
 ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

SCALE:	HOR. 1" = 20'
	VERT. 1" = 4'
DATE:	NOVEMBER 2016
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	
PR-03	
SHEET NO. 17 OF 36	

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MEMORANDUM

TO: Brian Cleary, P.E.,
Howard County Department of Public Works
Stormwater Management Division

FROM: Kathy L. Hoverman, P.E.
KCI Technologies, Inc.

DATE: June 2, 2017

SUBJECT: Howard County Community College Restoration Project Construction
As-Built Review
KCI Job Order No. 17133314.111

Meadville Land Services Contractors (MLS) completed construction of the Howard Community College stream restoration project in March 2017. George William Stephen Jr. and Associates Inc. conducted an as-built survey of the stream corridor immediately after construction to ensure that the survey represents the condition of the channel immediately following construction and was not influenced by severe weather or other outside factors. As-built survey was completed over a period of time from February 1st through the 20th. The survey data presented to KCI Technologies Inc. (KCI) by MLS are based on the design baseline of construction, which runs the entire project site, with stationing, and right and left bank designations oriented in the downstream direction. As-built data were overlaid on the Construction Drawings of the grading plans and profiles by MLS. MLS also provided a CADD file of the as-built survey which KCI used to generate cross sections. These cross sections were needed to fully evaluate the constructed results and are provided as an attachment to this memo.

Stream restoration occurred on an unnamed tributary to the Little Patuxent River and the named LPR-1 tributary to the Little Patuxent River. Restoration of the upstream reach (Reach 1) on the unnamed tributary is approximately 430 linear feet (LF) and ends downstream at the culvert at Scholarship Drive. Reach 2 continues on the unnamed tributary and starts at the outfall at Scholarship Drive and includes one outfall. Restoration of Reach 2 starts at station 7+28 and extends 998 LF downstream to a confluence with LPR-1. Reach 3 is on LPR-1 and originates from a storm water management pond. It daylights from a culvert at station 20+00 but restoration did not begin until station 20+72. Reach 3 extends downstream for 403 LF to the confluence with the unnamed tributary.

Discrepancies greater than 0.3 feet (ft) are considered to be beyond the tolerance limits as determined by KCI's established criteria. These areas are identified and described herein. Discrepancies are generally documented using the greatest vertical and/or horizontal deviation from the proposed cross section. However, several adjustments were made in the field during construction that would affect the as-built survey. A list of those changes discussed in the weekly summary reports can be found in Table 1 below.

Most of the field changes encountered include grading adjustments in order to accommodate tree saves within the College's property. In these cases, construction of steeper tie-ins or narrower benches than proposed were approved by KCI (the Engineer) in the field and are not considered variances from the design.

Table 1. Summary of approved field changes during construction.

<i>Station</i>	<i>Weekly Summary</i>	<i>Field Change</i>
Wetland (adjacent to 3+50)	Week 5	Wetland contour elevations were raised due to exposed electrical line decreasing the overall depression of the wetland.
7+70 to 8+25	Week 5	The centerline was shifted to the right to avoid removing large trees.
15+75 to 16+25	Week 9	The stream was rerouted to the right to avoid removing several trees. Alternating roughness was then installed on opposite side.
16+75 to 17+50	Week 9	Stream width was widened to keep consistent with upstream dimensions.

Mainstem 0+00 through 4+50 (Reach 1)

A variety of discrepancies outside the approved variance and not associated with an approved field change are noted below.

The invert at station 2+07 appears to be 0.6 feet lower than designed. Station 2+07 is close to the head of a riffle and could influence overall channel slope. The channel invert in the pools from stations 2+78 through 3+26 appear to be 0.5 ft higher than designed.

None of the benches designed between 2+00 and 2+67 are visible on the as-built drawings. Instead the bank continues at an angle upward to tie-in to the existing bank. This could reduce the floodplain connection that is an important part of the design. However, many of the cross sections examined from 2+00 to 2+07 have some other lowered bench or cross section variation that will help with some of the floodplain connection intended with the design. From 2+20 to 2+67 the cross section does not display this characteristic and is considered oversized. Stations 2+20 to 2+25 also reflect channel inverts approximately 0.5 ft lower than designed.

Sections 4+00 through 4+25 reflect an over-excavated channel. The constructed channel width is twice as wide as designed and the constructed invert is lower than designed. The bench features were not constructed on either side of the channel. Section 4+25 is the transition to the culvert so its overwide dimensions are acceptable as it ties into the existing wing walls.

Other minor variations exist in the cross section overlays in the Reach 1 stream channel. Those variations lie within the KCI standards of 0.3 ft or are deemed to be a result of inherent survey overlay. The wetland cross sections display greater variance but, this change was a field approved change due to an electrical line being so close to the surface.

Mainstem 7+28 through 17+26 (Reach 2)

From station 7+70 to 8+25 the channel dimensions were altered and horizontal alignments shifted to save trees on the right bank and a large specimen tree along the left bank. The channel was shifted first to the left and then over to the right to avoid the root system of the specimen trees. This was a KCI approved field change.

Typical riffle and pool features occur from station 7+28 to 17+26. Riffle grade control features are also included in this area, which are constructed using the same dimensions as typical riffles, but constructed using larger channel bed material. Horizontal and vertical variances were observed throughout the riffle and pool features that are outside of the KCI tolerance.

Throughout the reach, riffle features appear to be constructed lower than designed, with variances ranging from 0.4 to 1.0 ft below designed elevations. It is possible that some of the variation may be the result of some of the voids in the cobble materials being surveyed, which may not represent the overall bed elevation. However, in addition to the cross section, the profile also reveals lower bed elevations in the riffle features. This can have an effect on overall channel slope and potentially channel stability. Riffle features constructed at or near the design elevations may provide grade control sufficient to maintain the designed channel slope. The table below summarizes the discrepancies for the riffle reaches in Reach 2.

Table 2. Summary of notable vertical discrepancies in riffle features.

<i>Riffle Stationing</i>	<i>Vertical difference (ft)</i>
7+70 to 7+77	-0.5
8+02 to 8+28	-0.4
8+60 to 8+80	-0.4
<i>9+03; 9+64; 10+52 heads of riffles</i>	<i>-0.1 to -0.2 (okay)</i>
11+06	-0.5
12+25 to 12+40	-0.7 (up to)
12+84 to 12+92	-0.4 to -0.6
12+98 to 13+33	-0.5

Vertical and horizontal variances in pool features are observed throughout Reach 2 as well. For example, sections 11+60 to 12+00 the channel is 0.8 to 1.0 ft lower, and sections 15+96 to 16+00 the channel is higher and shifted right to more closely match existing grades. These changes in

pool section are most likely a result of either shifting the channel slightly with the approved changes in Table 1 or adjusting the tie in slopes to avoid trees. In most cases, the pool cross sectional area appears to be the same or greater than designed. This should not cause channel instability. The pools will adjust, likely filling in if constructed with excess capacity.

Stations 11+92 and 12+78 are designed as riffle cross sections but appears more like pools with a cross sectional area more than 20 square ft larger than designed. Station 11+92 is more than a foot lower than designed.

While the shift of the meander bend from 15+50 to 16+75 was approved the constructed cross section lacks a defined point bar and has a more narrow section than typical for pools within the Reach.

From station 16+75 to 17+50 cross sections were widened to maintain same cross section width as upstream. Although stream was widened in this are the proposed shape was maintained. This change was approved in the field as seen in Table 1.

Mainstem 20+72 to 24+75 (Reach 3)

Only minor variations exist in Reach 3, however the constructed channel shape does not conform well to that of the design The only major adjustment was made at the upstream tie in point at station 20+72 where there was a drop from the existing rip-rap in the channel. The proposed cross section was changed and approved in the field to create a gradual slope from the rip-rap to the proposed elevation to prevent a scour pool formation in the channel. Excess riprap was also placed along the banks of this section to create a gradual slope from the existing riprap to the newly created bench.

The following riffle features are lower than design by more than the 0.3 ft tolerance: station 23+02 to 23+18 (-0.5), station 24+75 to 25+00 (-1.0).

Horizontal variance beyond the 0.3 ft tolerance was observed beginning near 23+40 and continuing to through 23+50. Channel over-widening ranges from approximately 1.8 ft to 3.5 ft. The tie in slope angle on the right bank was decrease to reduce the cut into tree roots that were adjacent to the designed tie-in location. The combination between the channel shift and tie in slope change eliminated the bench in this area.

Summary

The Howard Community College Stream Restoration was constructed mostly in accordance with the design plans with minor and noted variances. Noted variances are missing riffle heads and benches around 2+00- 2+20, missing riffle heads at 11+92 and 12+78 and overwide channel from 23+50 to 24+30. Monitoring cross sections should go in all or most of these locations. The

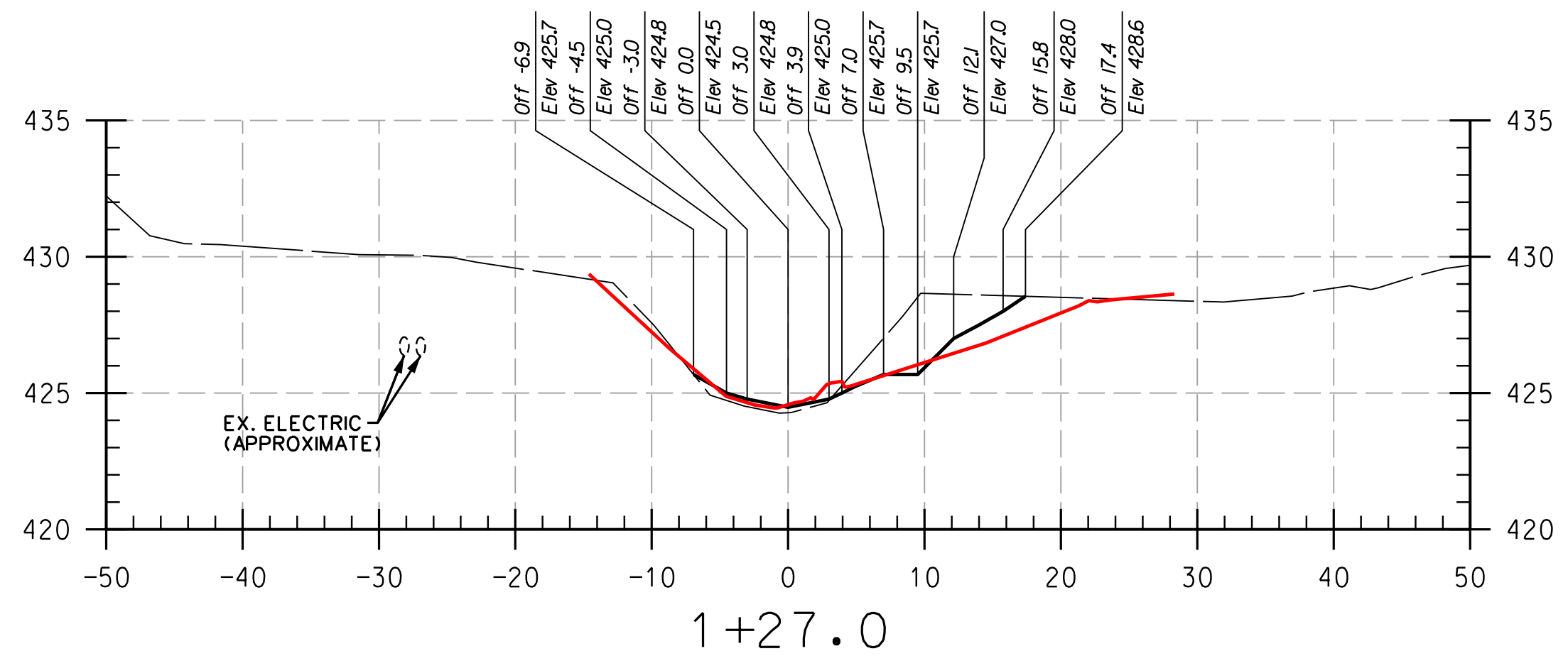
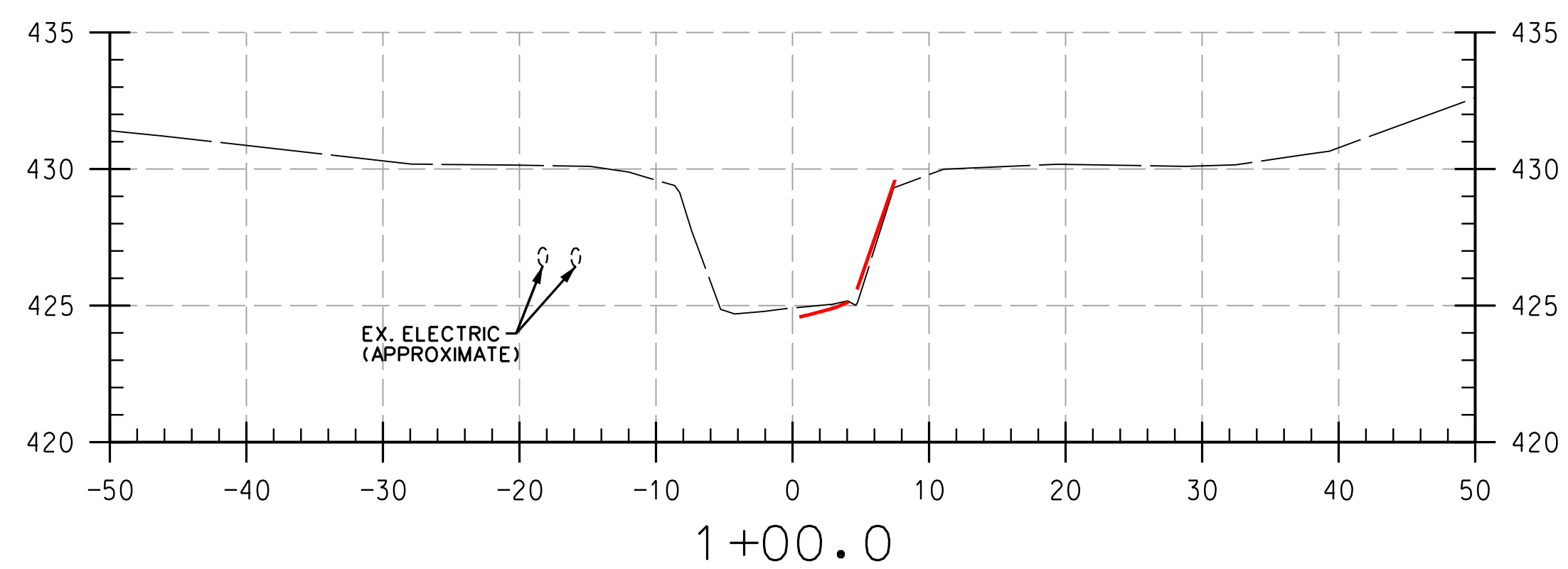
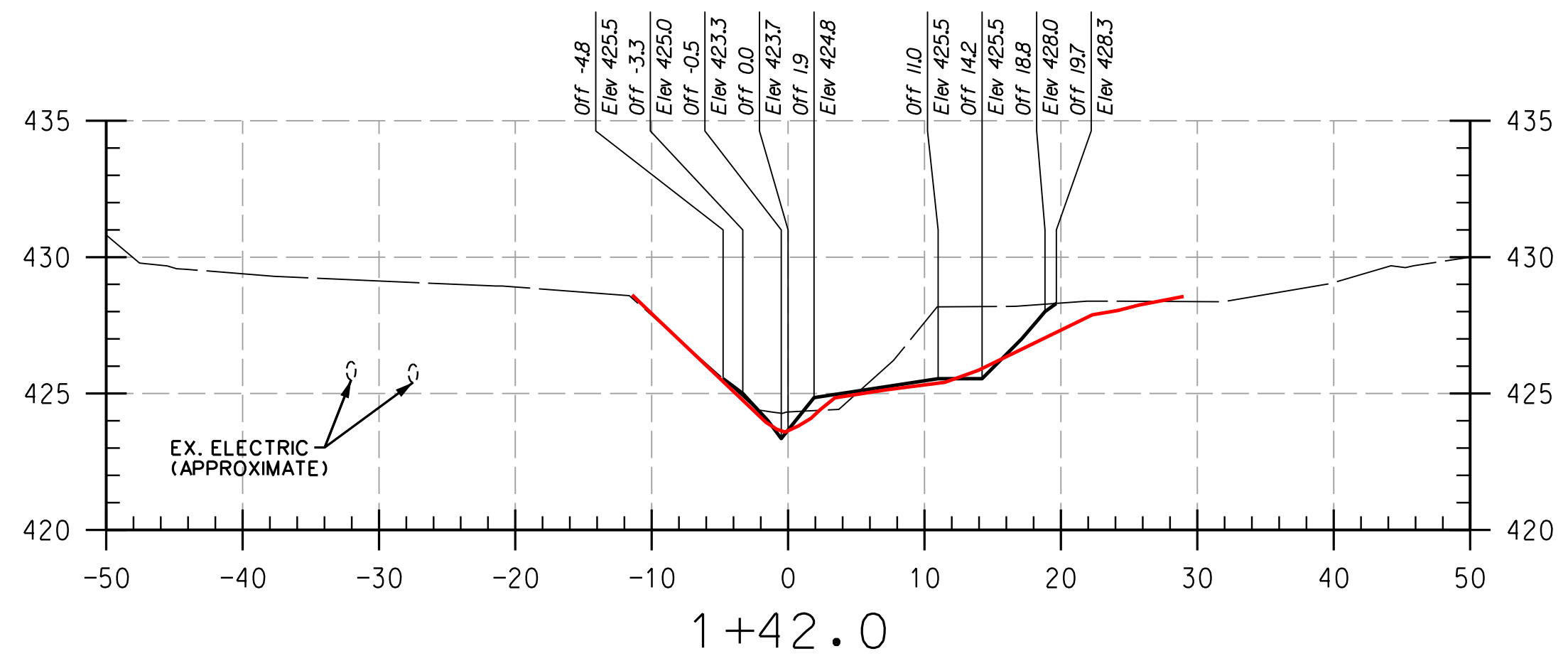
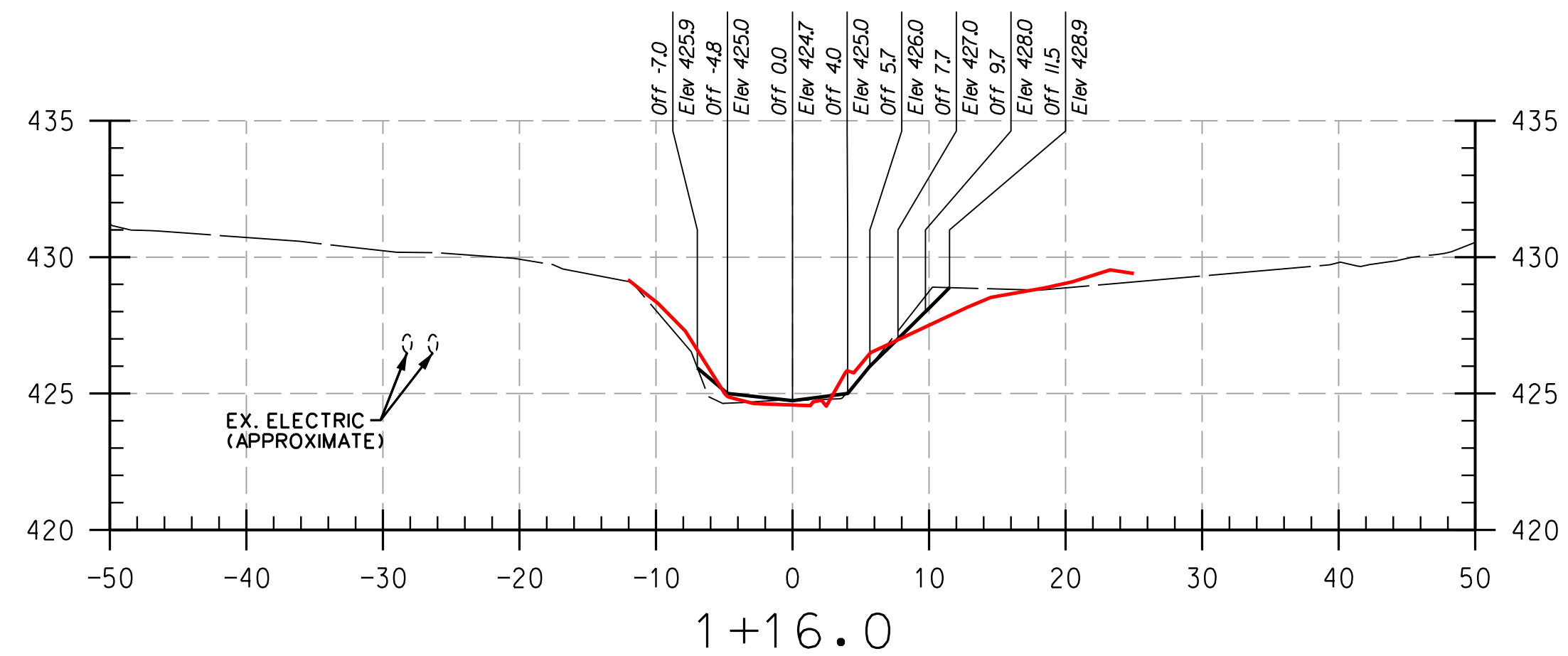
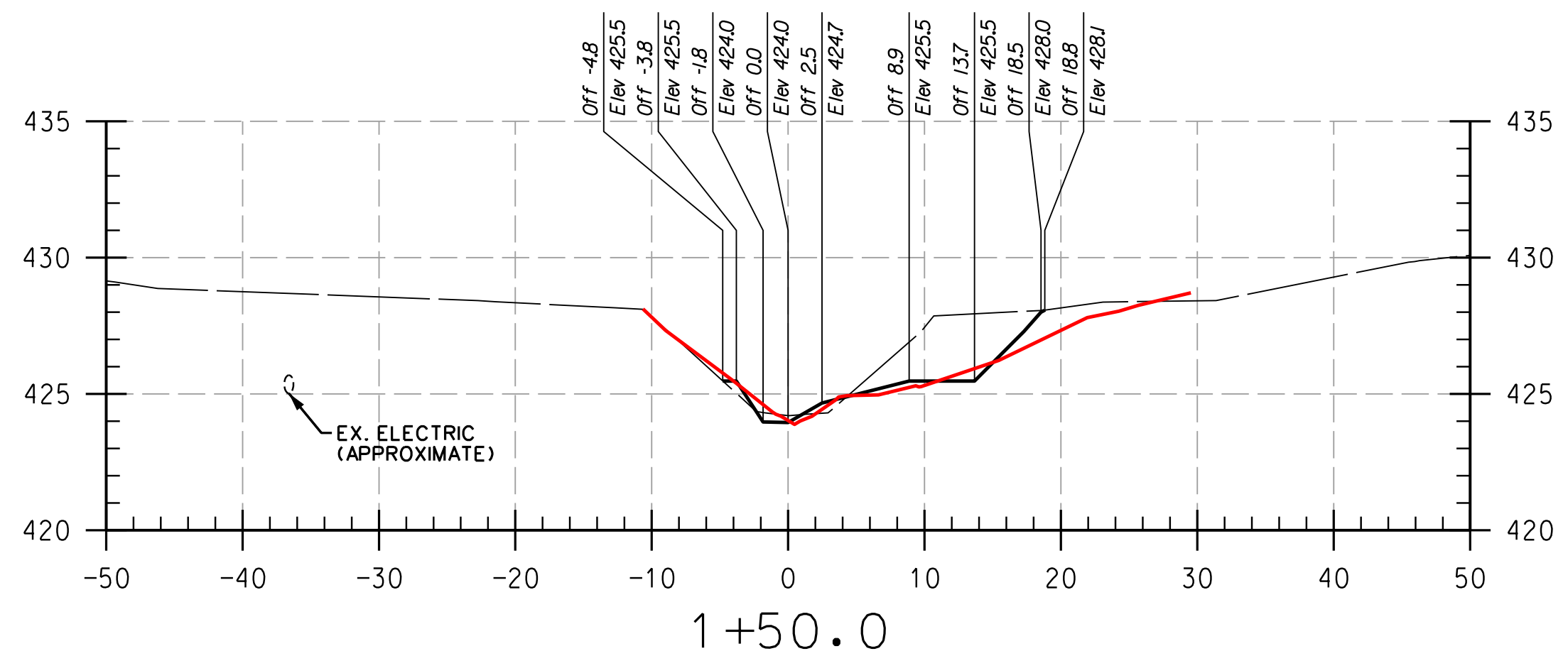
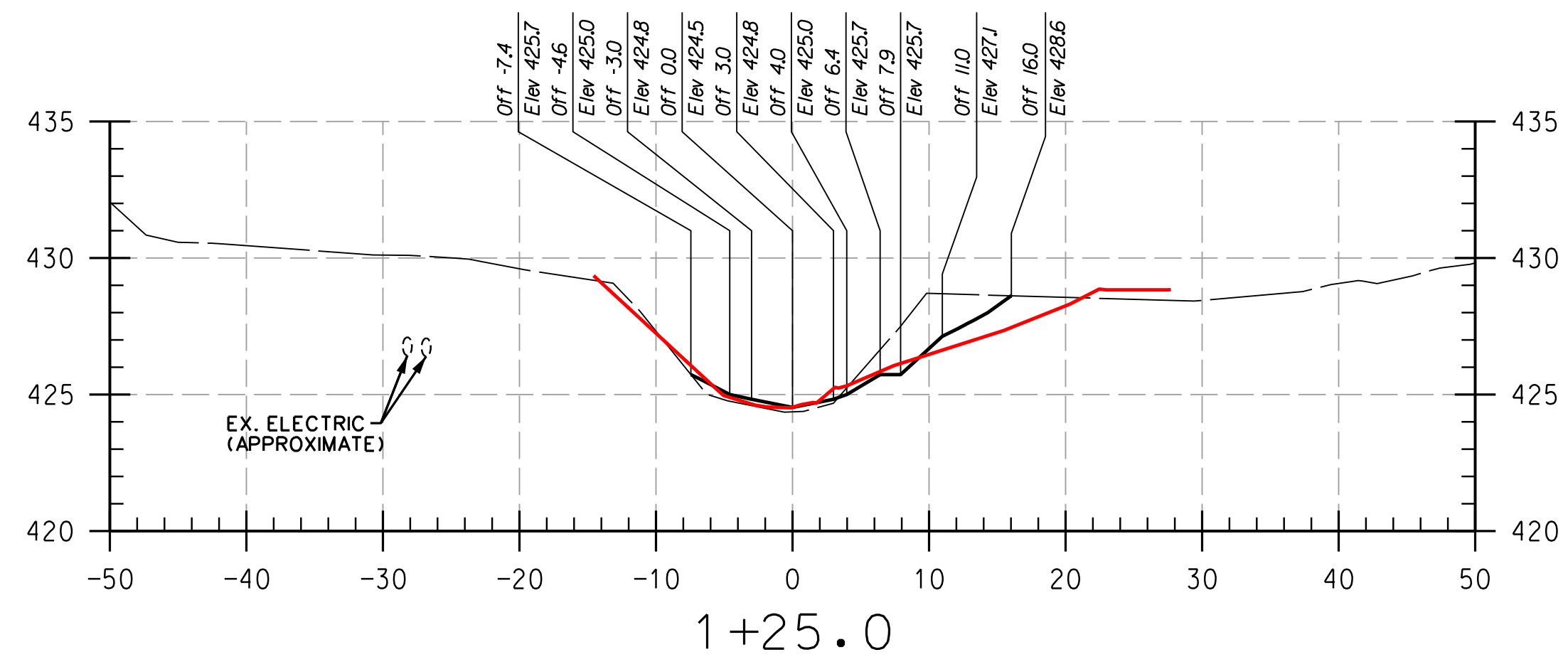
Howard Community College Stream Construction
As-built Review
Page 5 of 5
June 2, 2017

constructed channel should not have any impact on the installed structures or overall function of the restoration. However, based on the noted variances (and inherent channel adjustment), it is recommended that monitoring include detailed observations, if they are not included in cross section survey, of these locations to document any changes that occur due to the discrepancies and correct things as needed to ensure permit compliance.

If you have any questions regarding this as-built review please feel free to contact me at 804-887- 7531 x8551 or kathy.hoverman@kci.com.

KLH/sdr

Attachments:
MLS As-Built Drawings
KCI developed Cross Section Overlays



REACH 1

LEGEND
 EXISTING GRADE ———
 PROPOSED GRADE ———
 AS-BUILT GRADE ———

NOTE:
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 EXPIRATION DATE: JANUARY 06, 2018

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DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD
 SPARKS, MARYLAND 21152
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 FAX: (410) 316-7818
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HOWARD COMMUNITY COLLEGE
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 47, 81 TAX MAP 35.36
 ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

**AS-BUILT
 CROSS
 SECTIONS**

SCALE: HOR: 1" = 10'
 VERT: 1" = 5'

DATE: APRIL 2017

KCI JOB NO.: 17133314.83

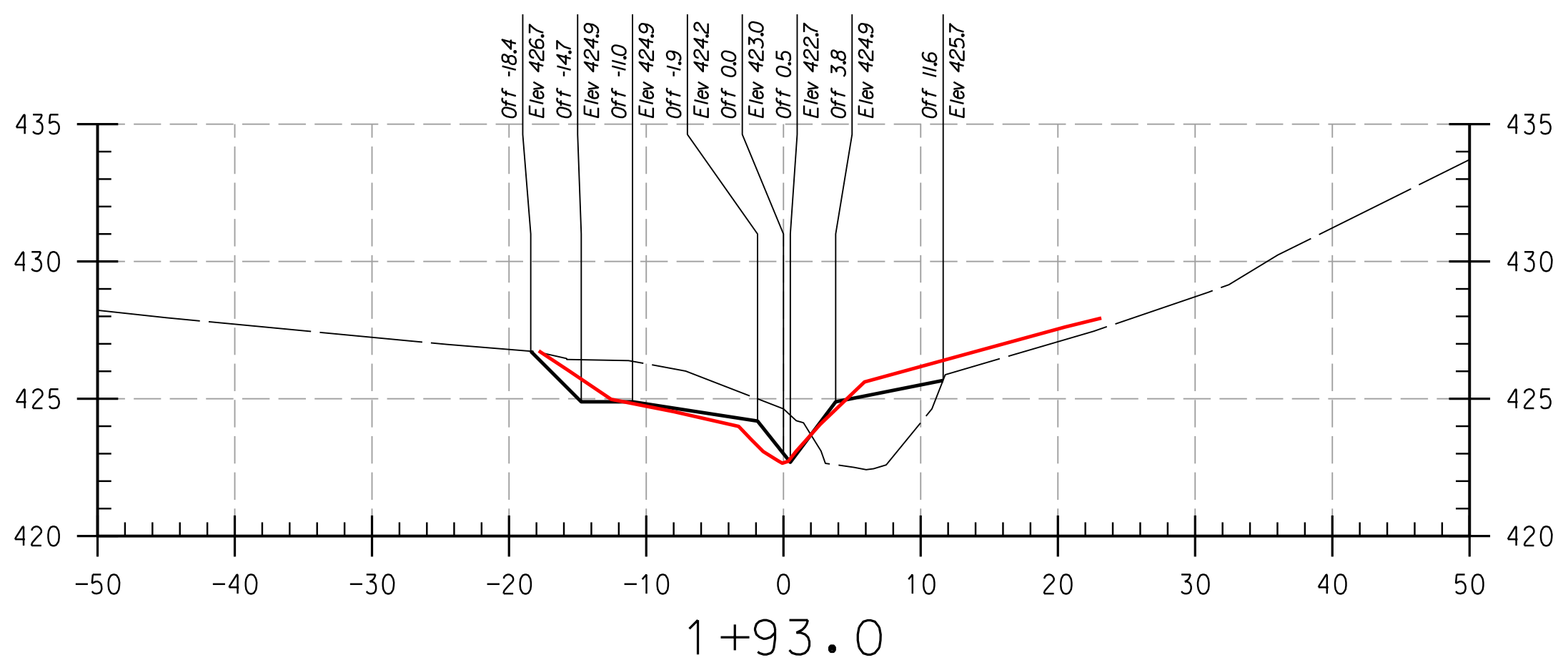
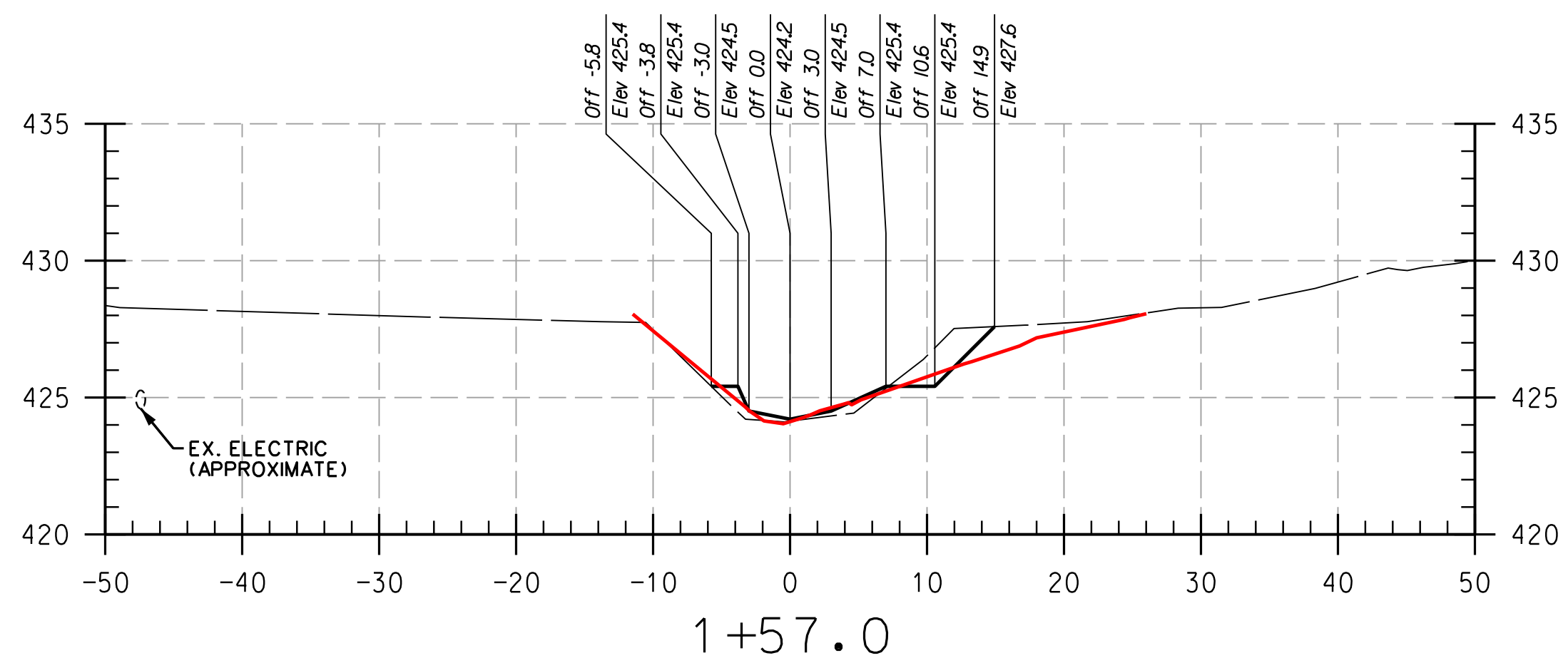
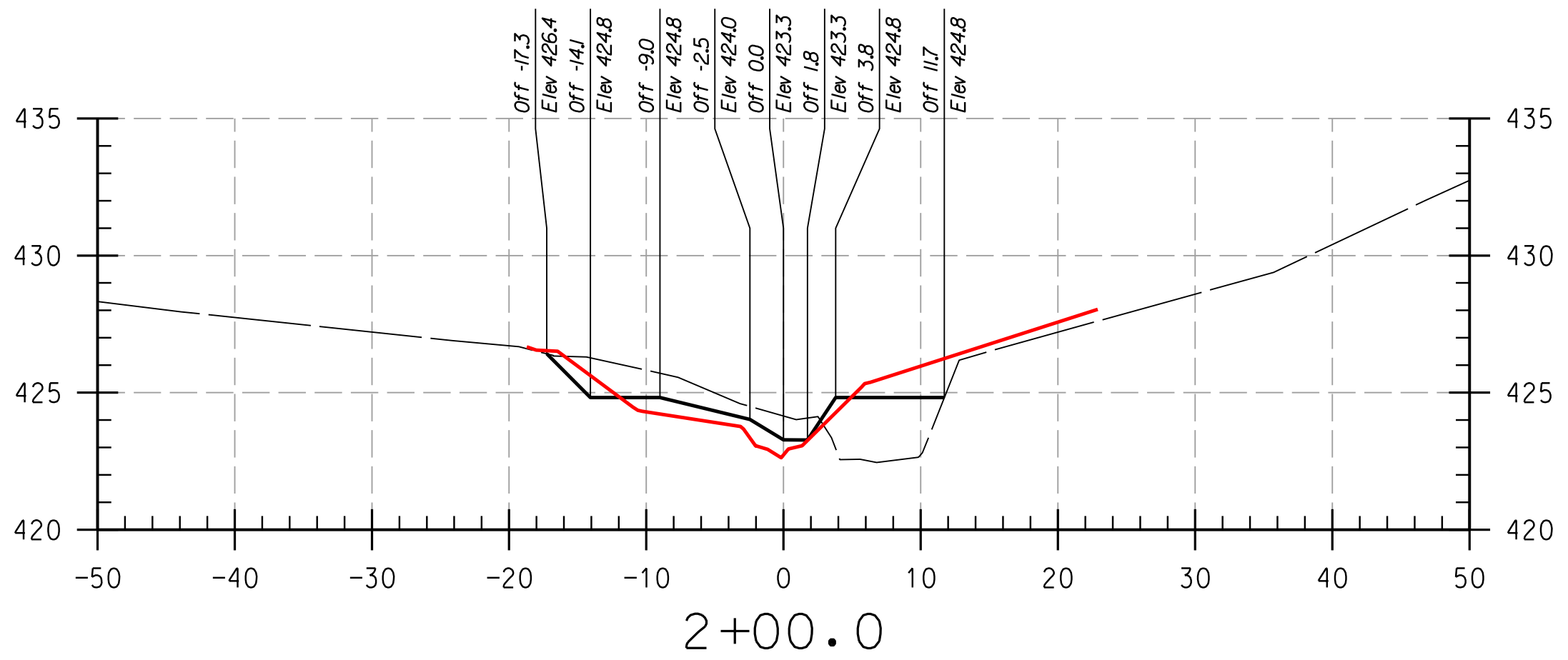
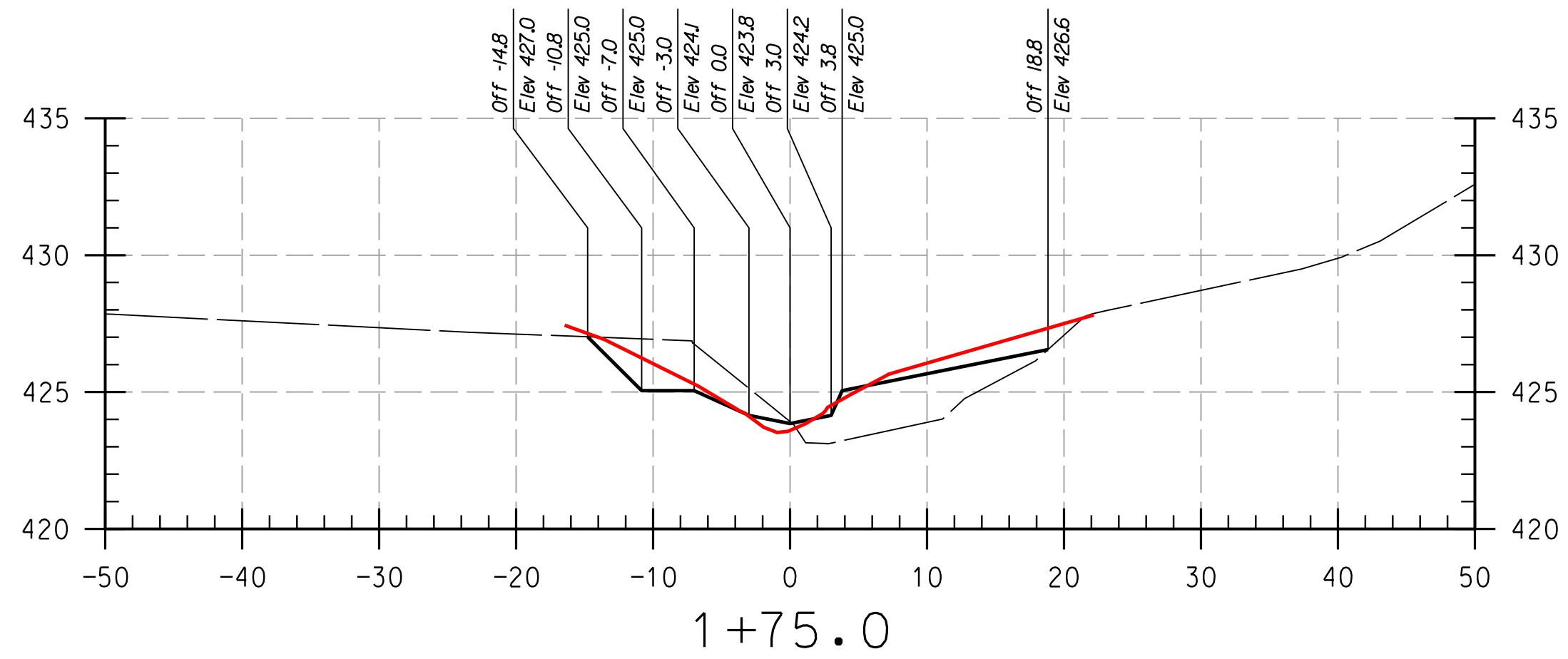
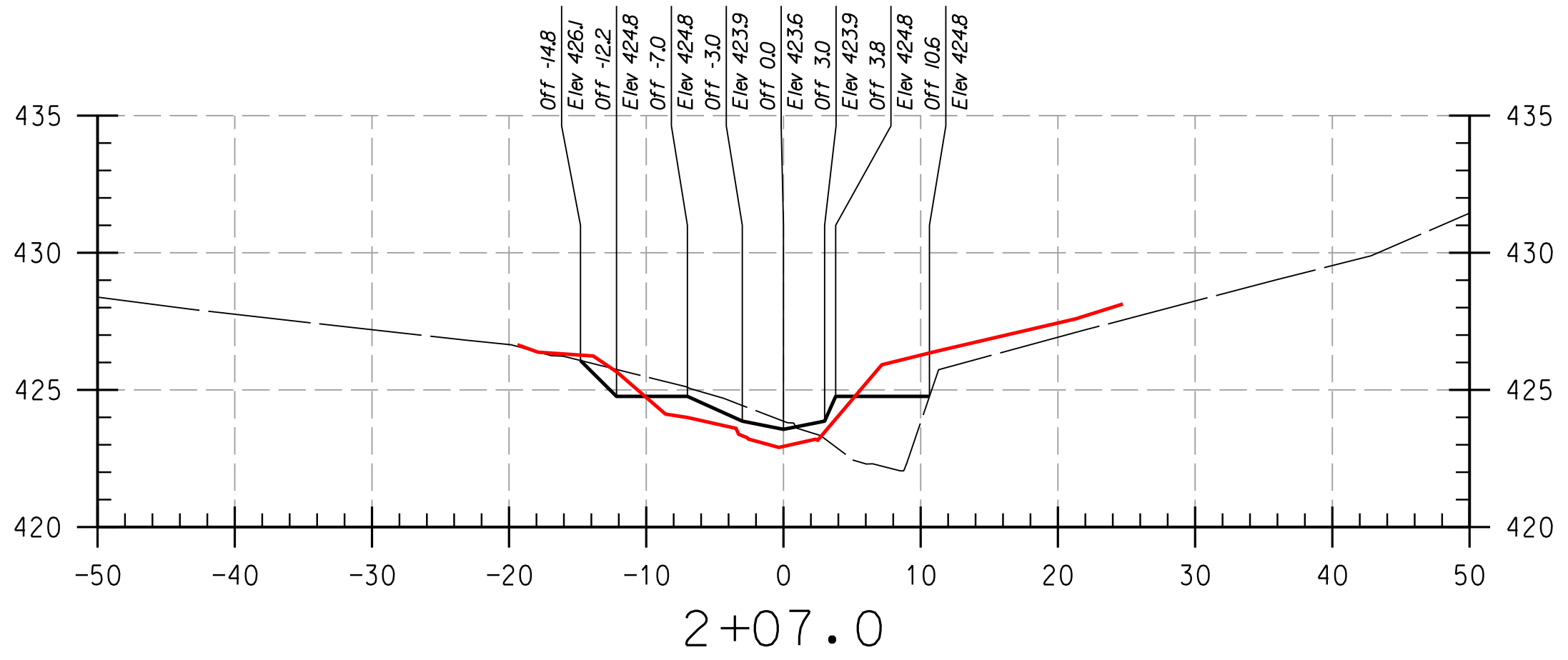
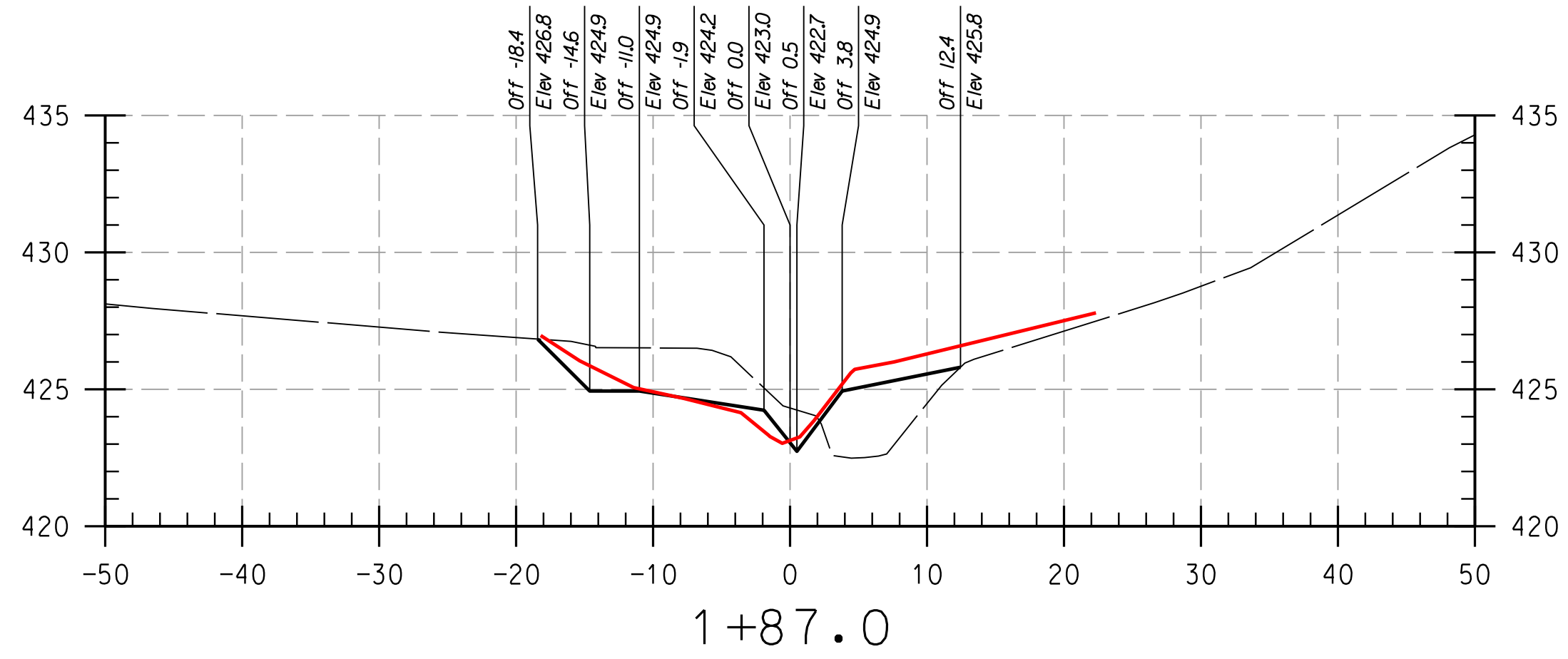
CAPITAL PROJECT NO.: D-1158

PERMIT ISSUE:

CONSTRUCTION ISSUE:

CS-01

SHEET NO.: 1 OF 27



REACH 1

LEGEND
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 PROPOSED GRADE ———
 AS-BUILT GRADE ———

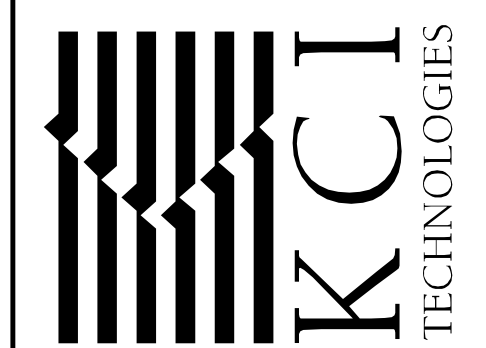
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HOWARD SCD _____	DATE _____	CHIEF, BUREAU OF ENVIRONMENTAL SERVICES _____	DATE _____

NO.	REVISIONS DESCRIPTION	DATE

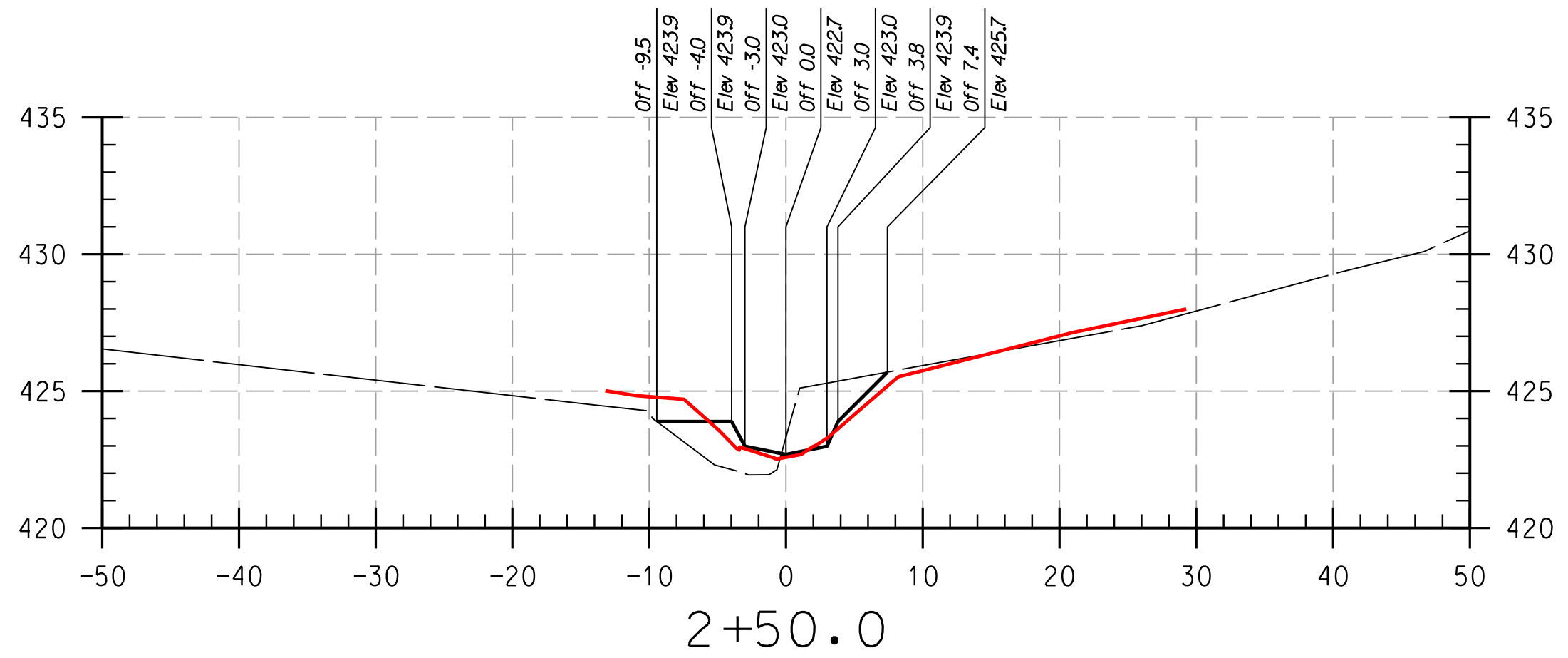
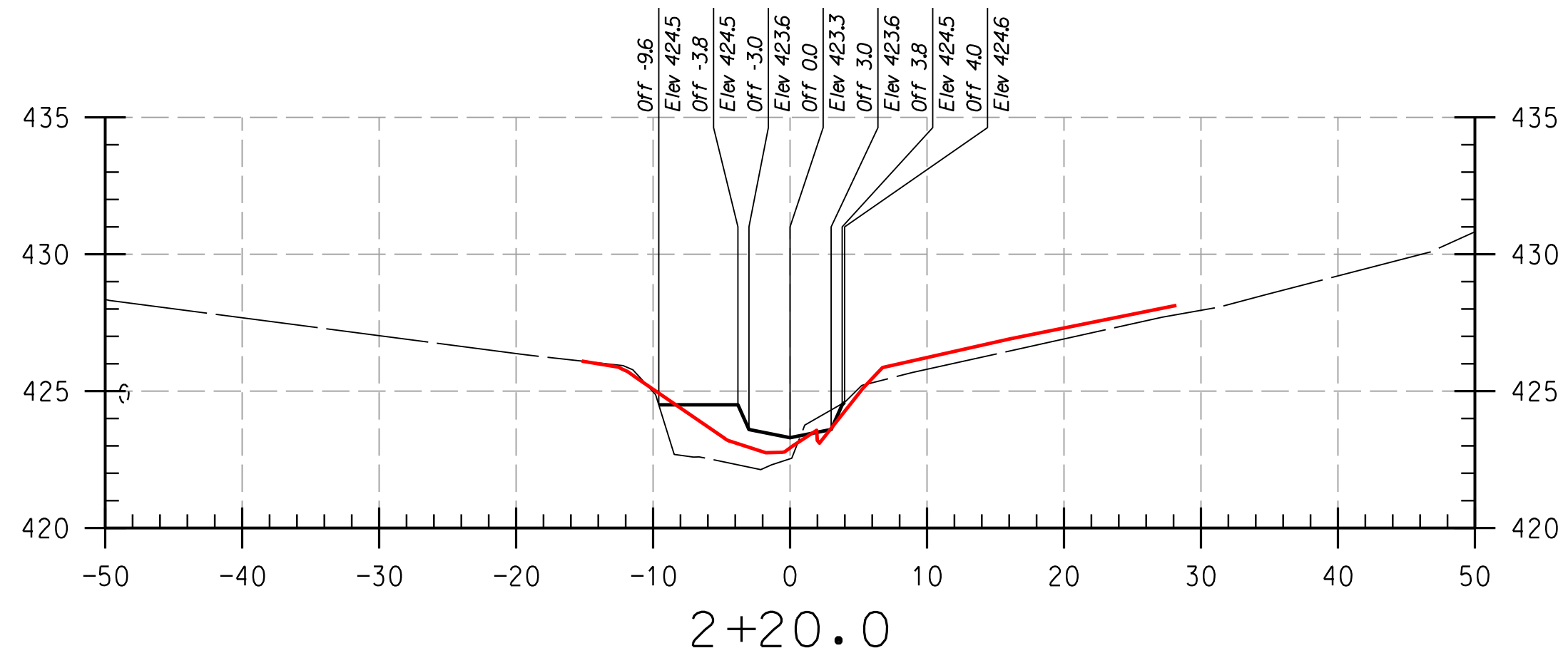
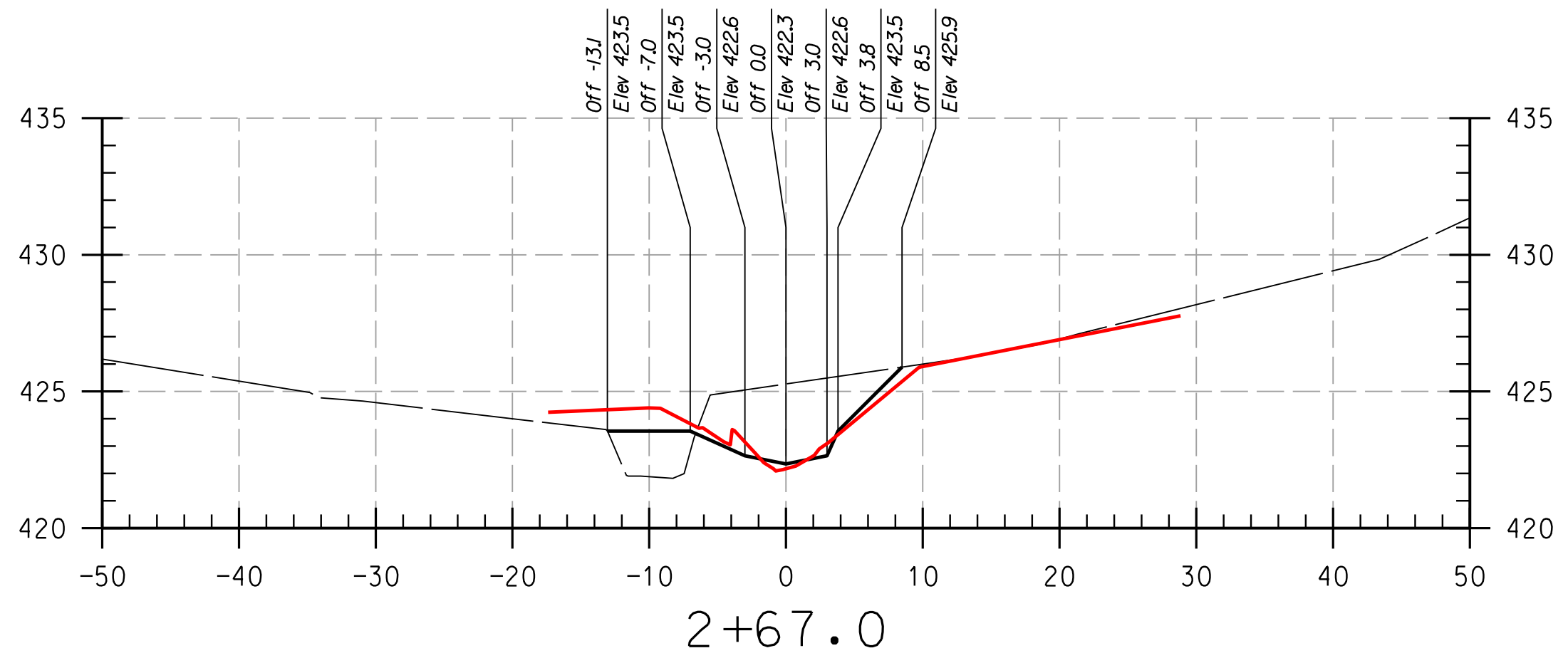
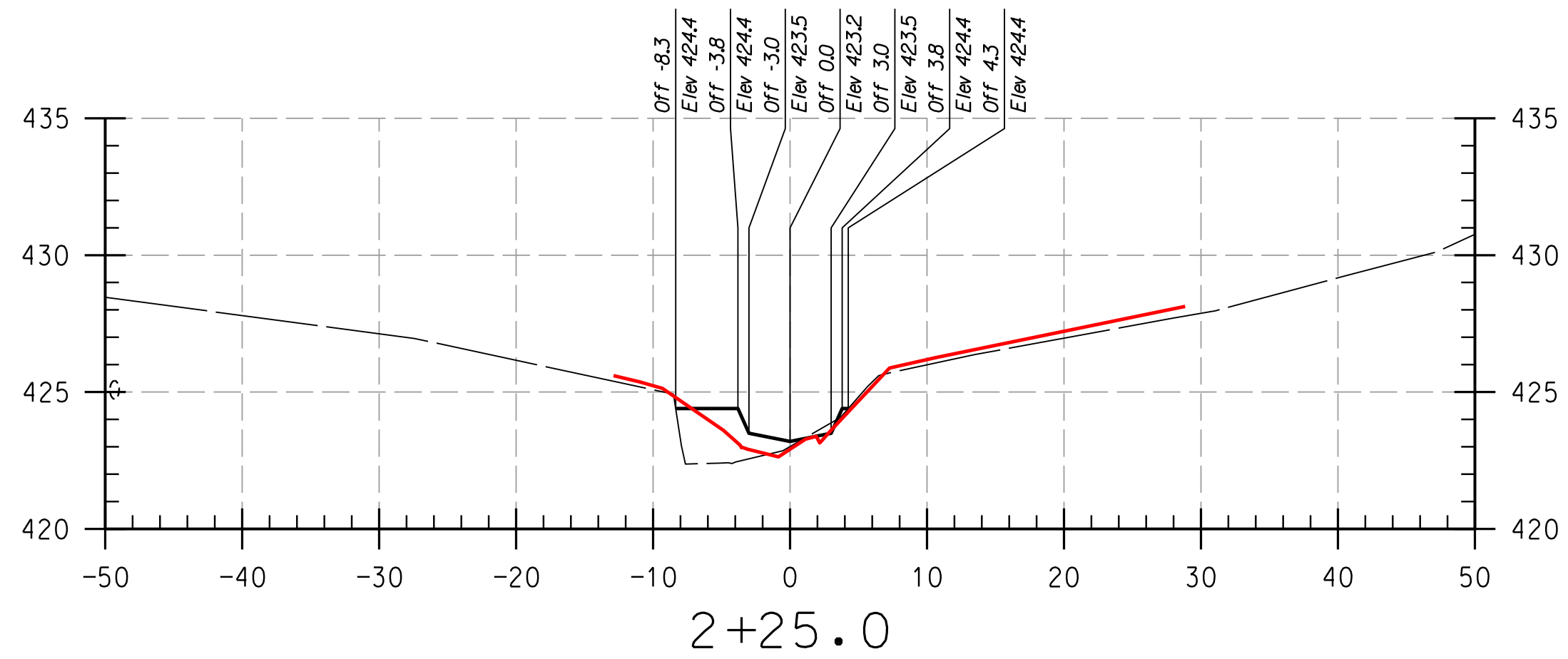
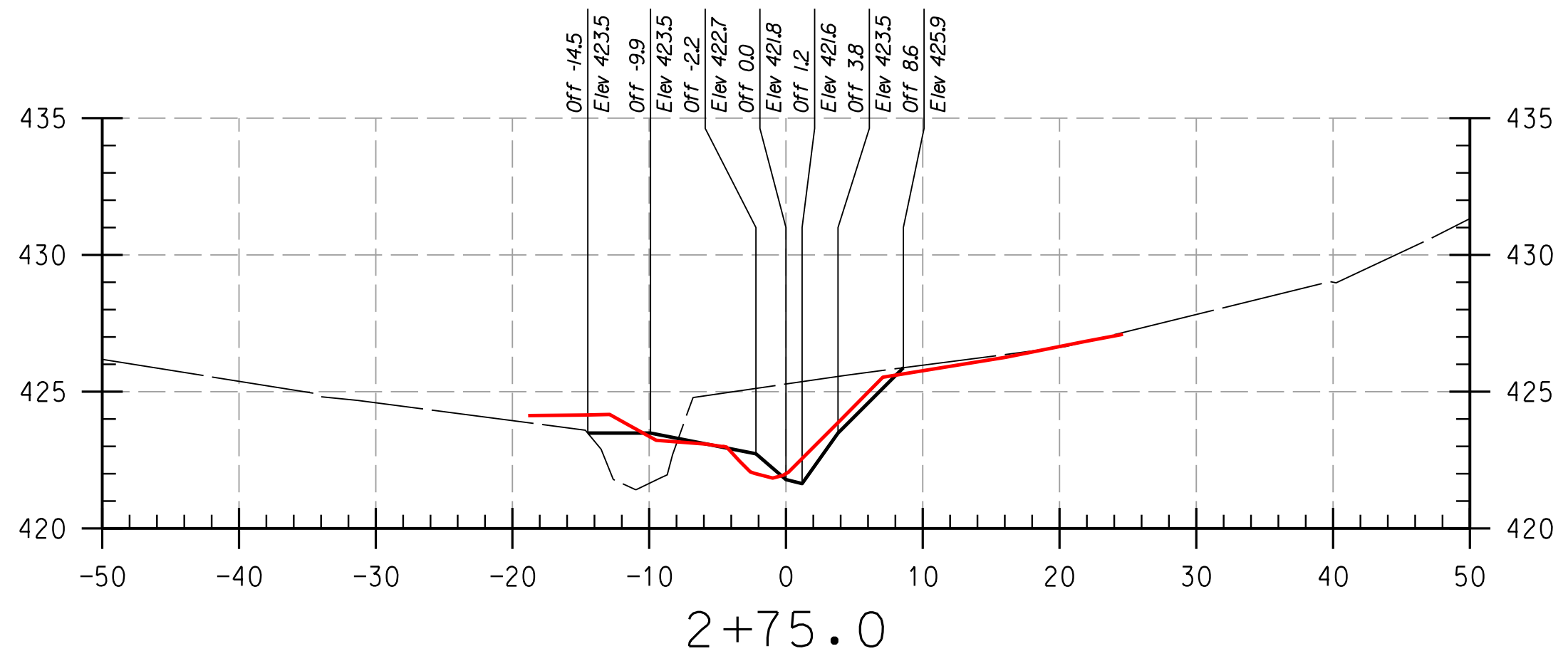
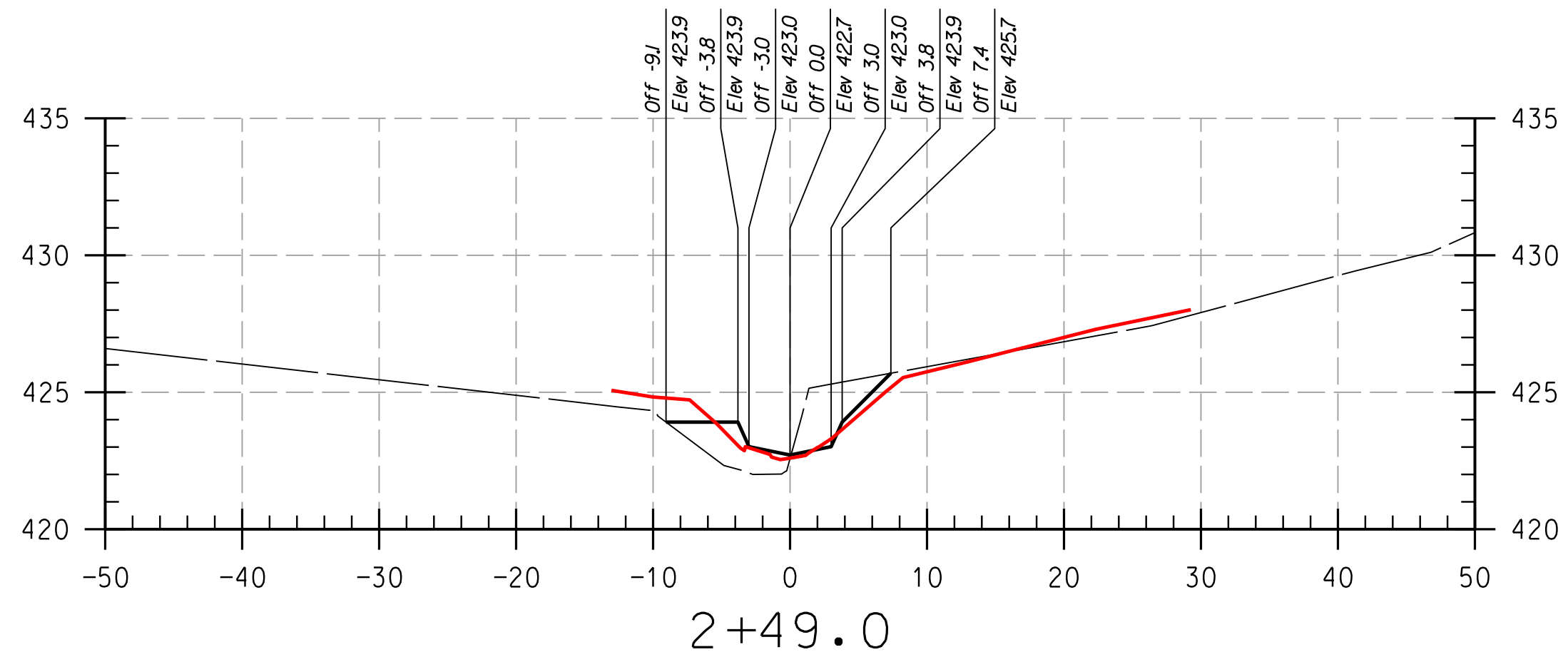
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HOWARD COMMUNITY COLLEGE
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
 COLUMBIA, MD 21046
 PARCELS 47, 81 TAX MAP 35.36
 ZONING: POR, NT ELECTION DISTRICT 05 GRID/BLOCK 0006

AS-BUILT CROSS SECTIONS

SCALE: HOR: 1" = 10'
 VERT: 1" = 5'
 DATE: APRIL 2017
 KCI JOB NO.: 17133314.83
 CAPITAL PROJECT NO.: D-1158
 PERMIT ISSUE:
 CONSTRUCTION ISSUE:



REACH 1

LEGEND

EXISTING GRADE _____

PROPOSED GRADE _____

AS-BUILT GRADE _____

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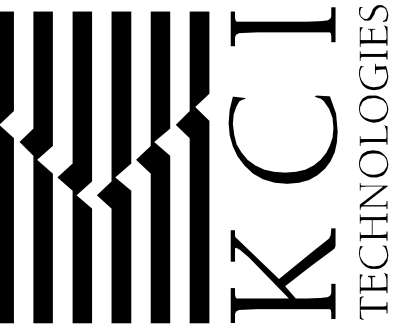
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DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

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AS-BUILT
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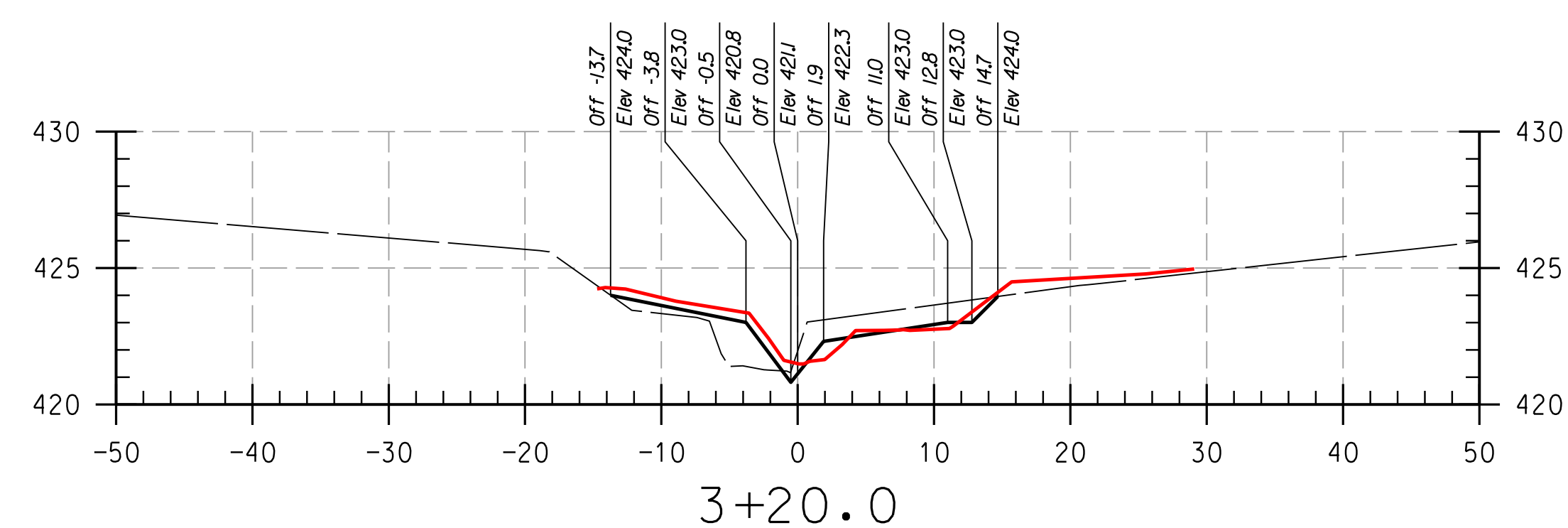
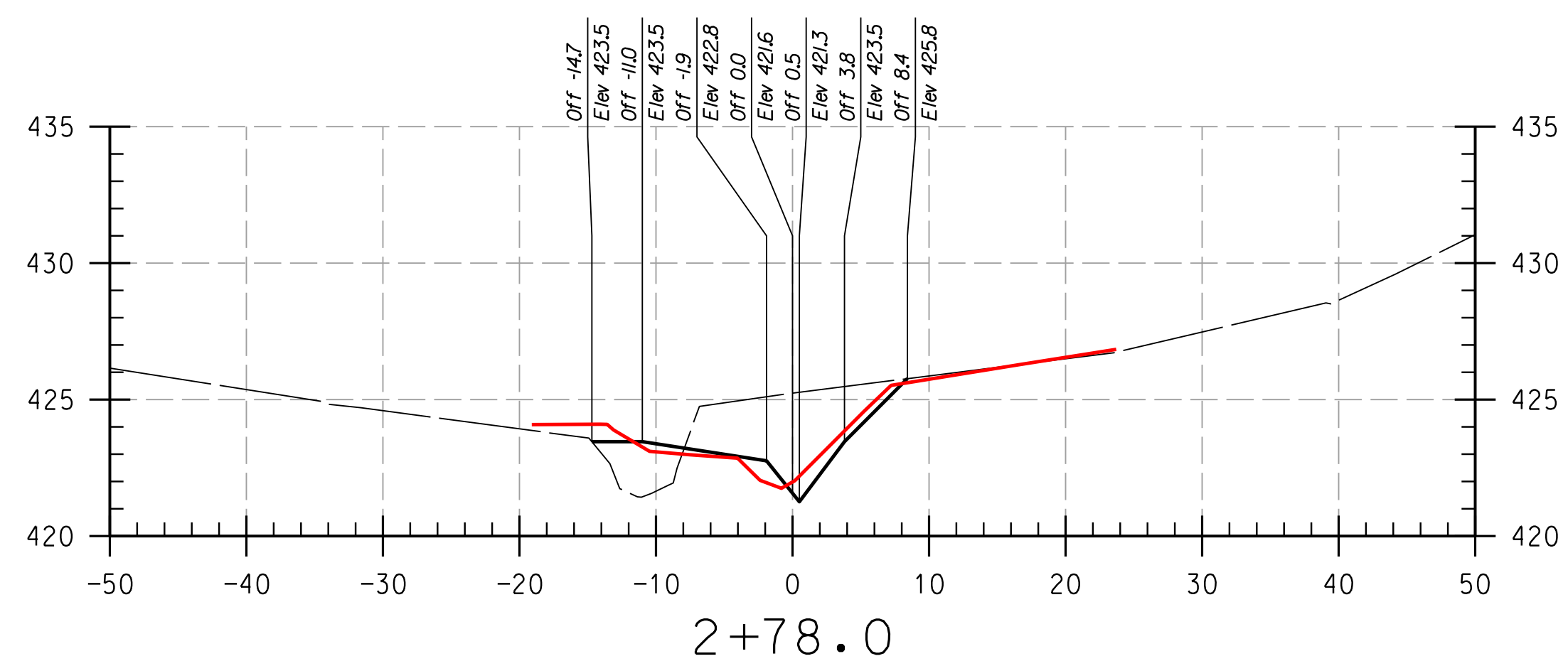
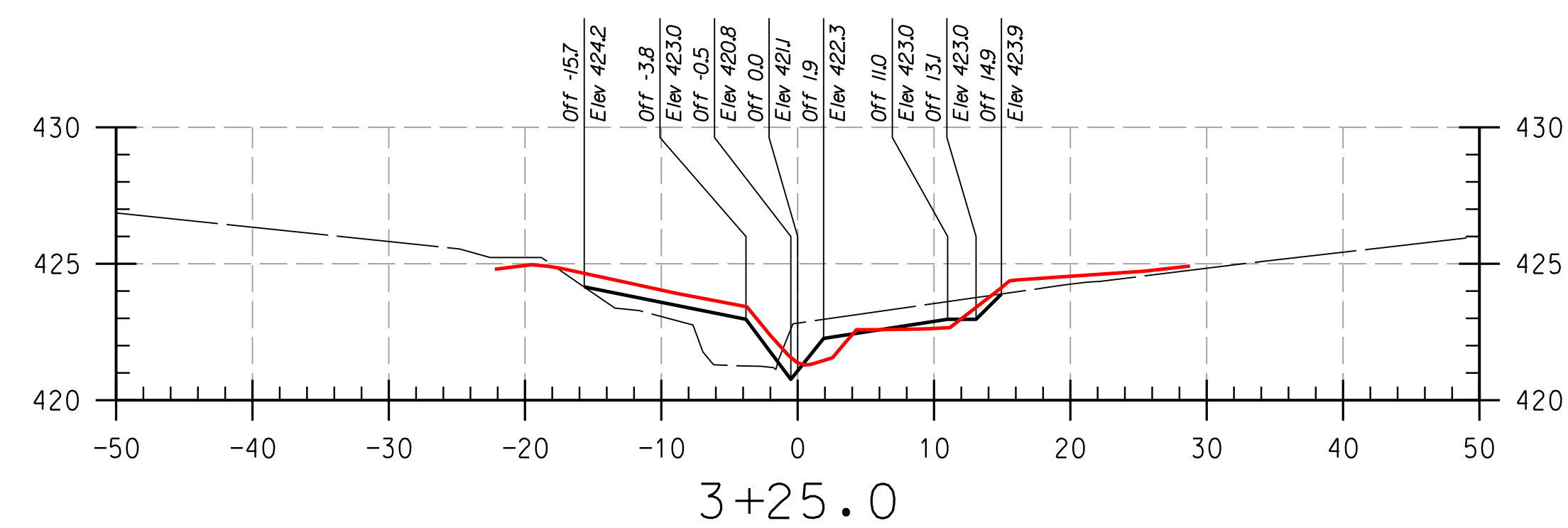
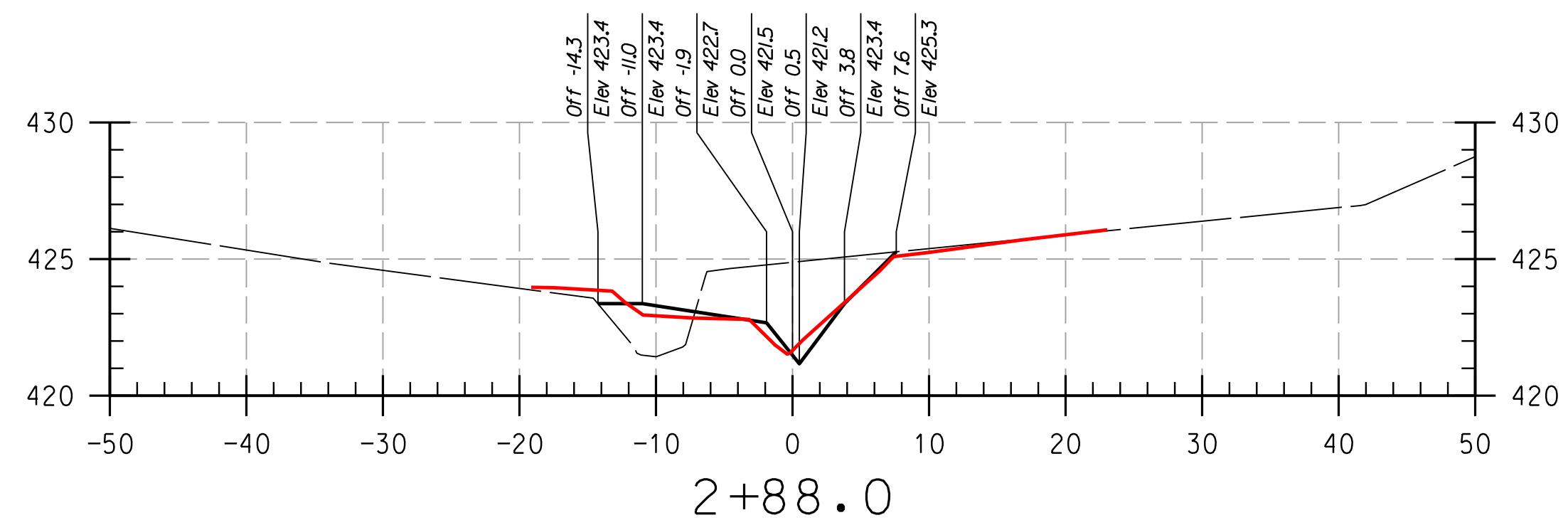
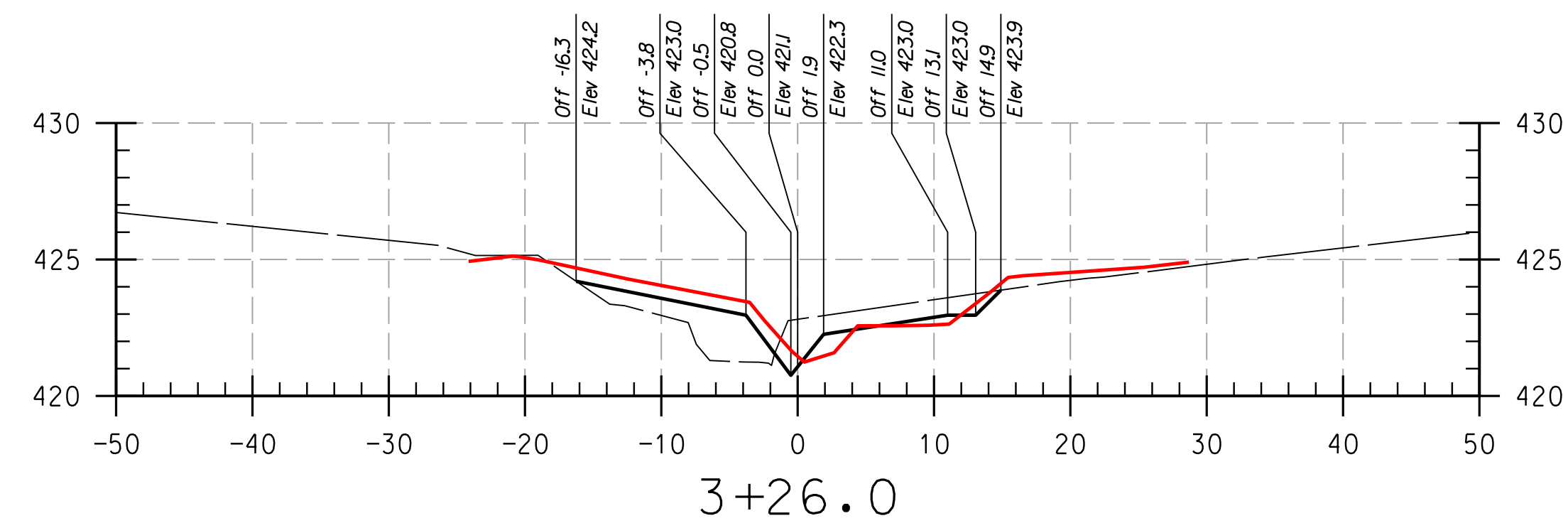
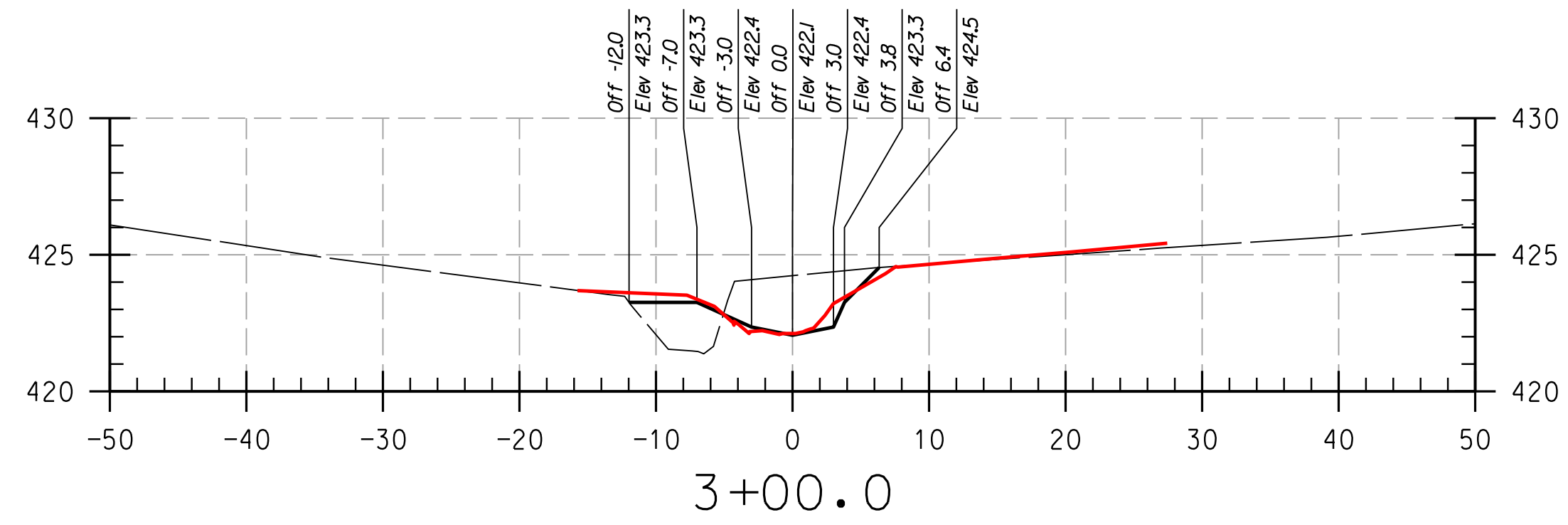
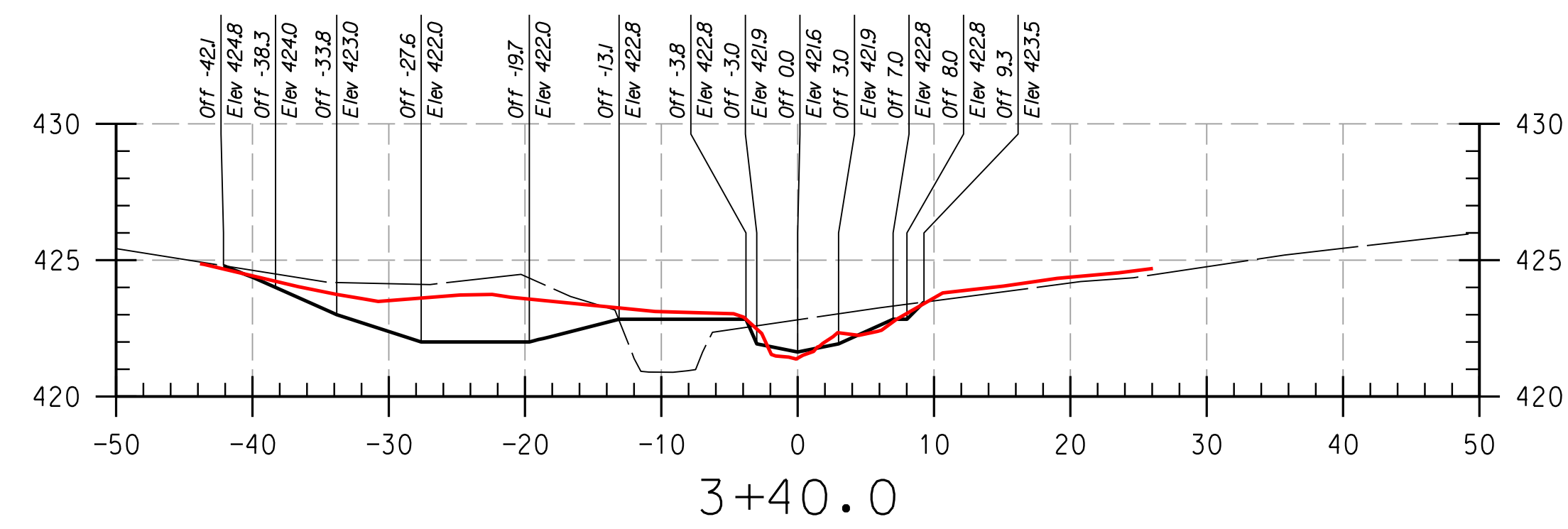
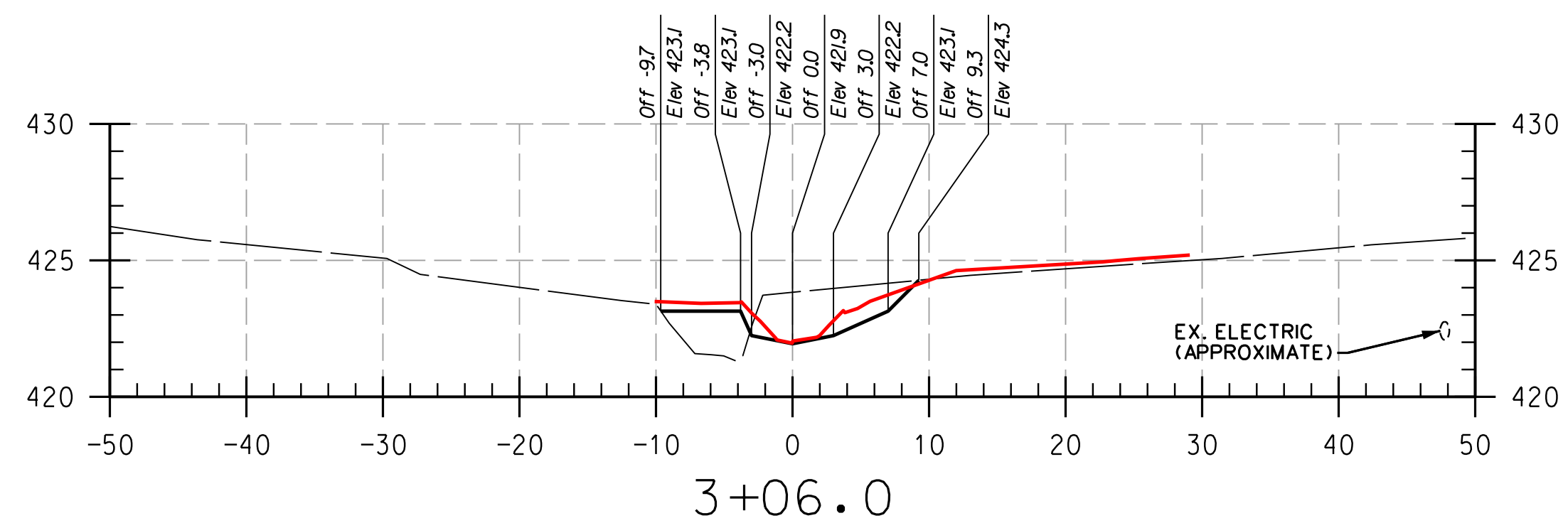
DATE: APRIL 2017

KCI JOB NO.: 17133314.83

CAPITAL PROJECT NO.: D-1158

PERMIT ISSUE:

CONSTRUCTION ISSUE:



REACH 1

LEGEND

EXISTING GRADE	(dashed line)
PROPOSED GRADE	(solid black line)
AS-BUILT GRADE	(solid red line)

NOTE:
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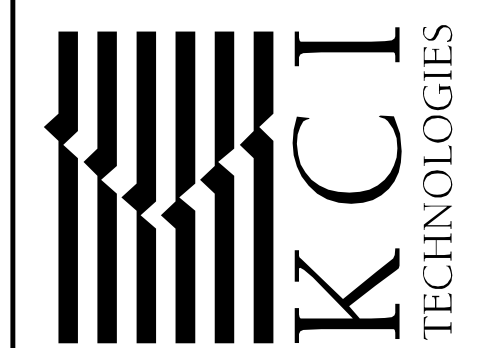
DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES _____ DATE _____

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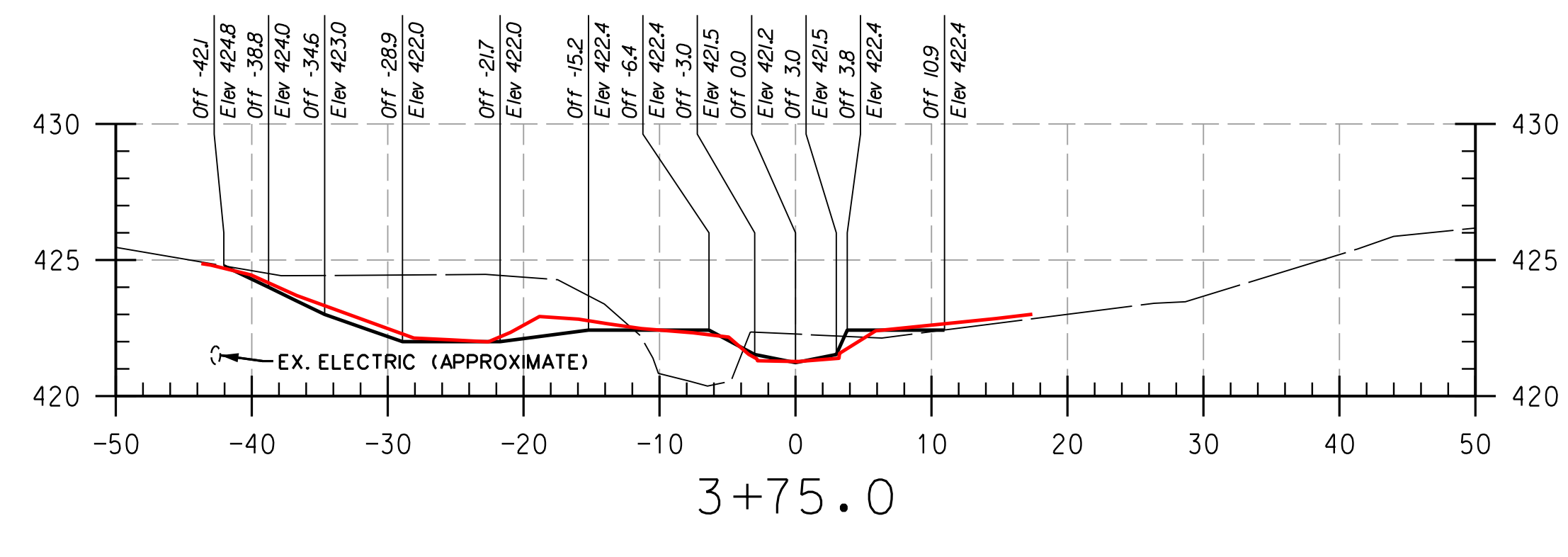
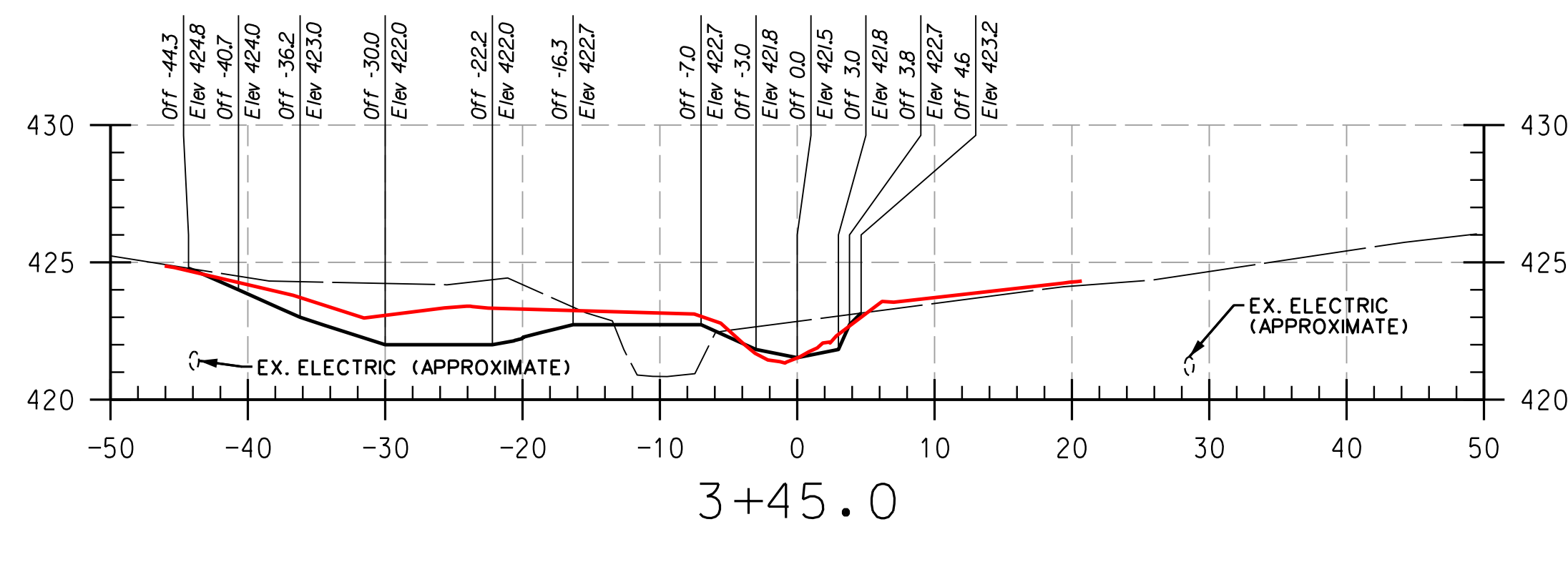
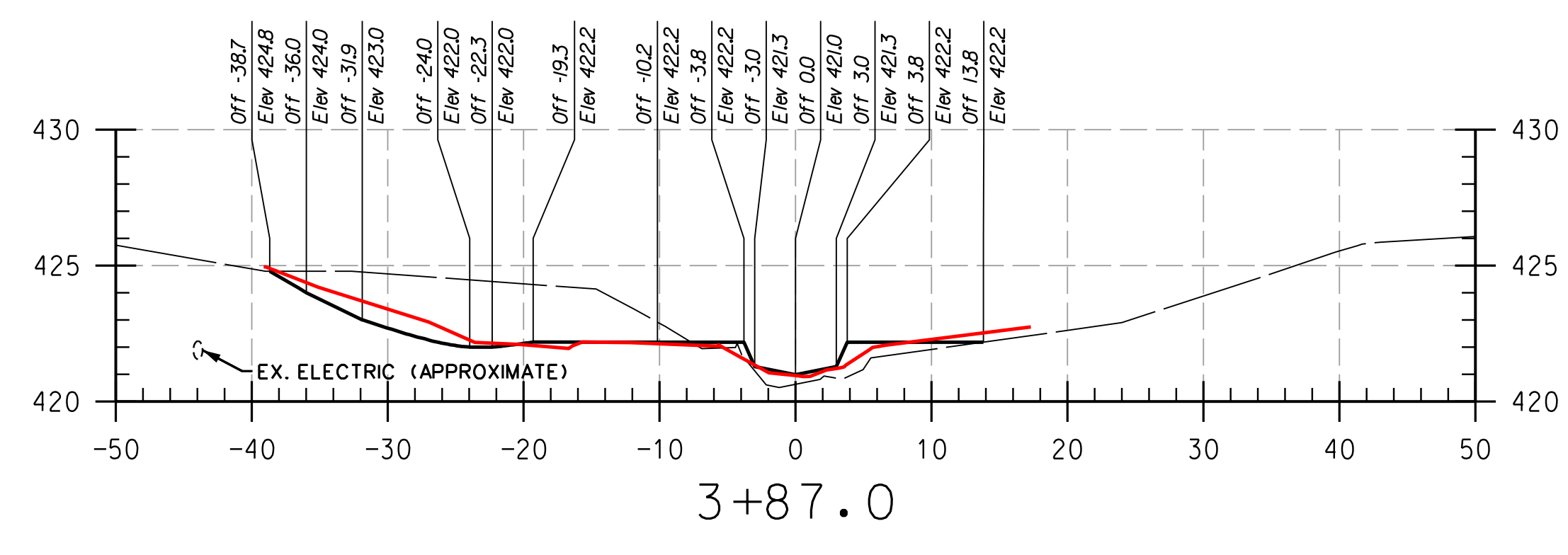
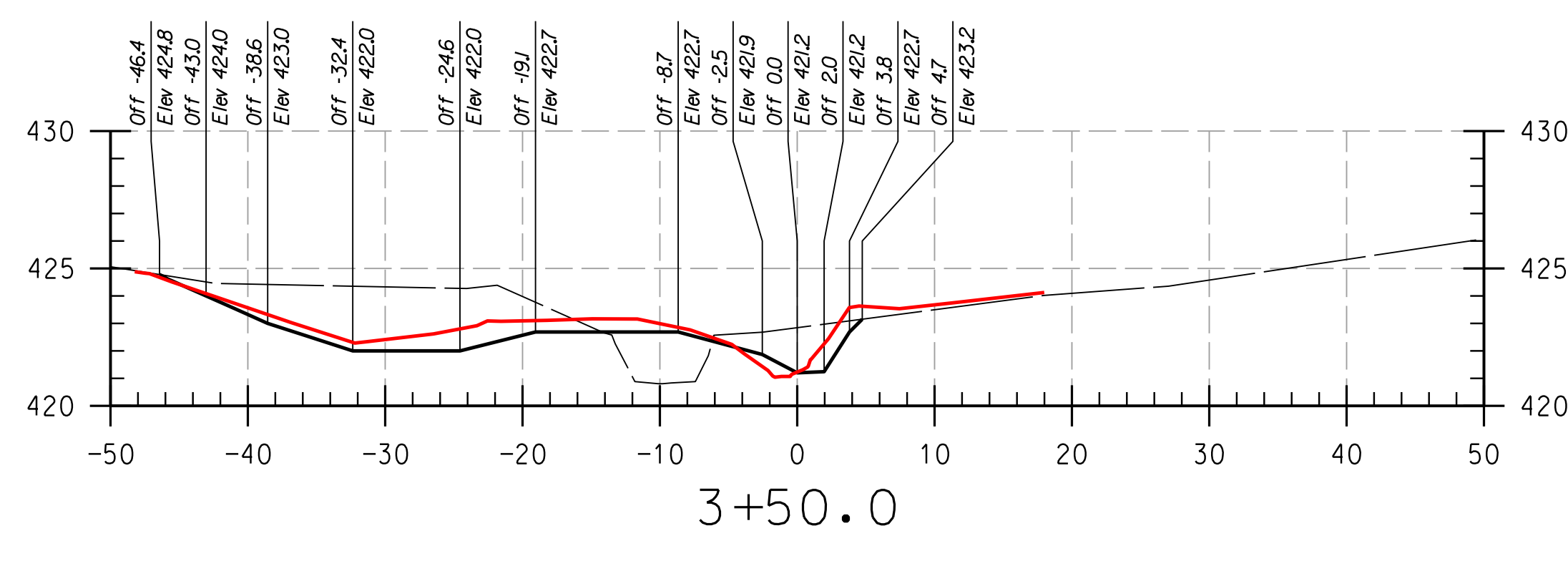
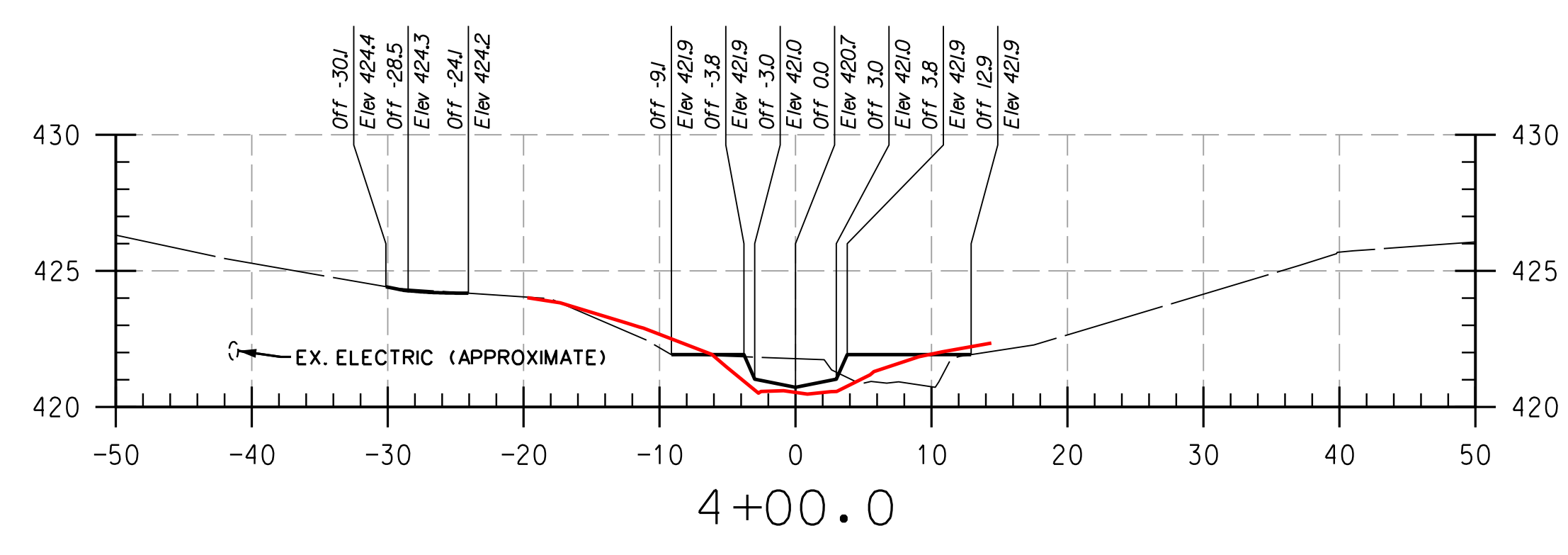
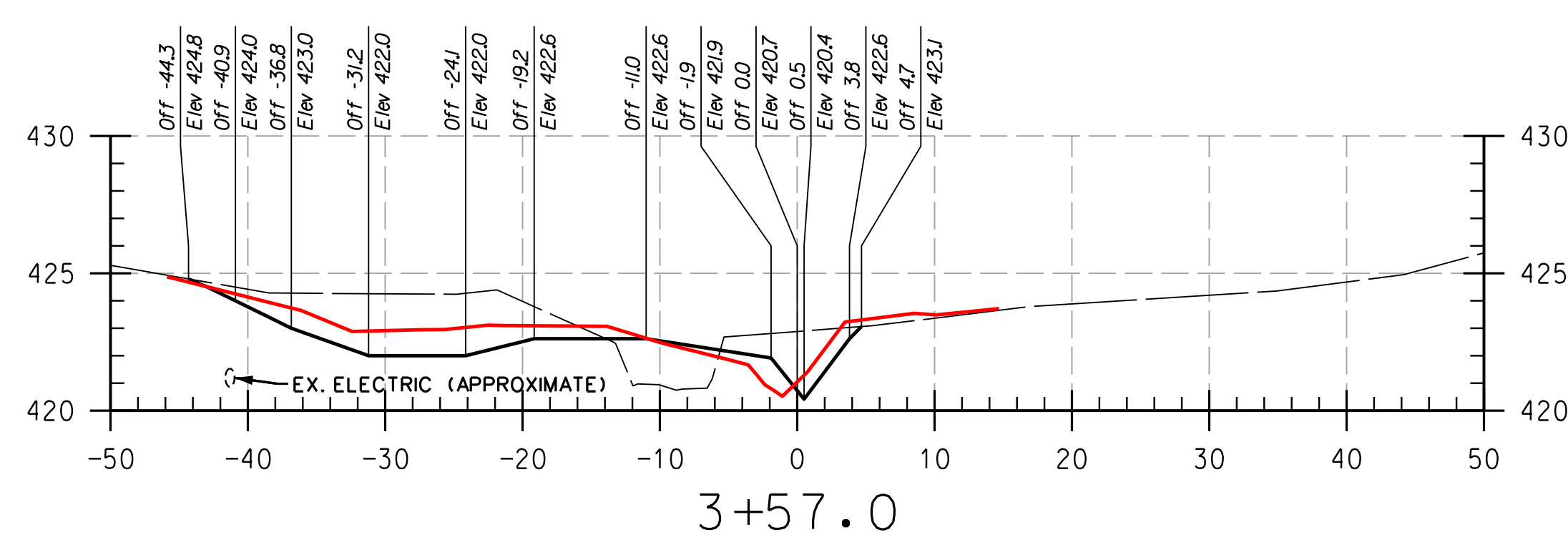
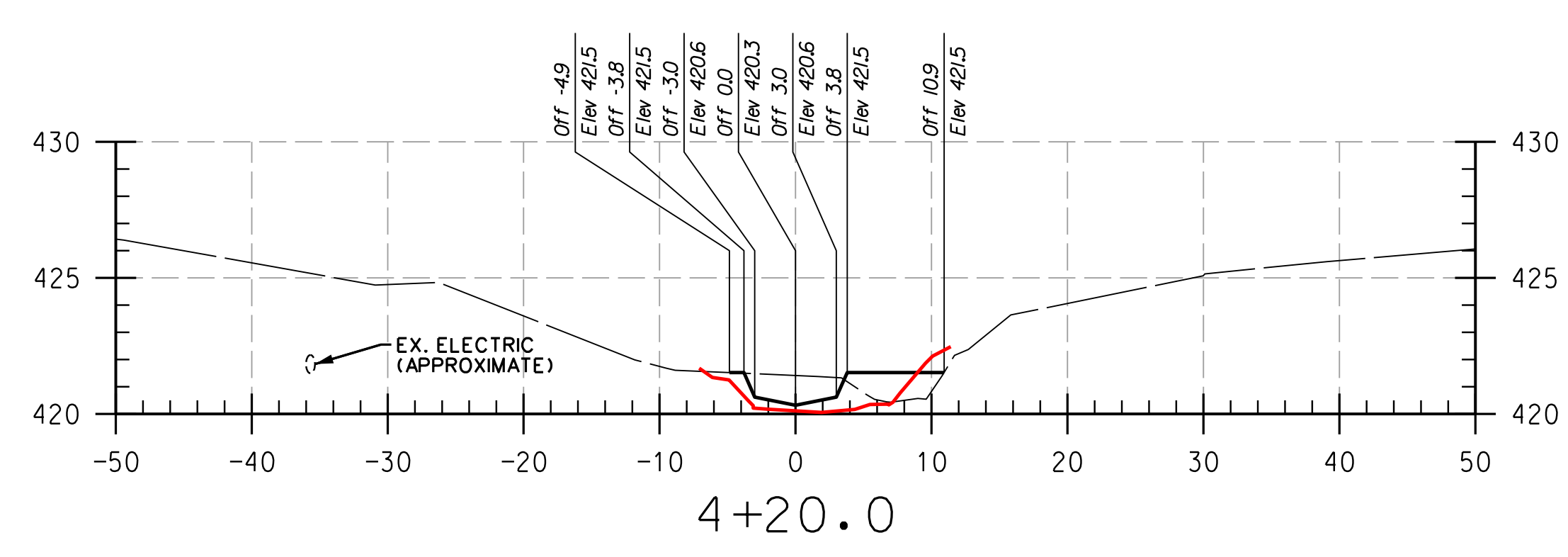
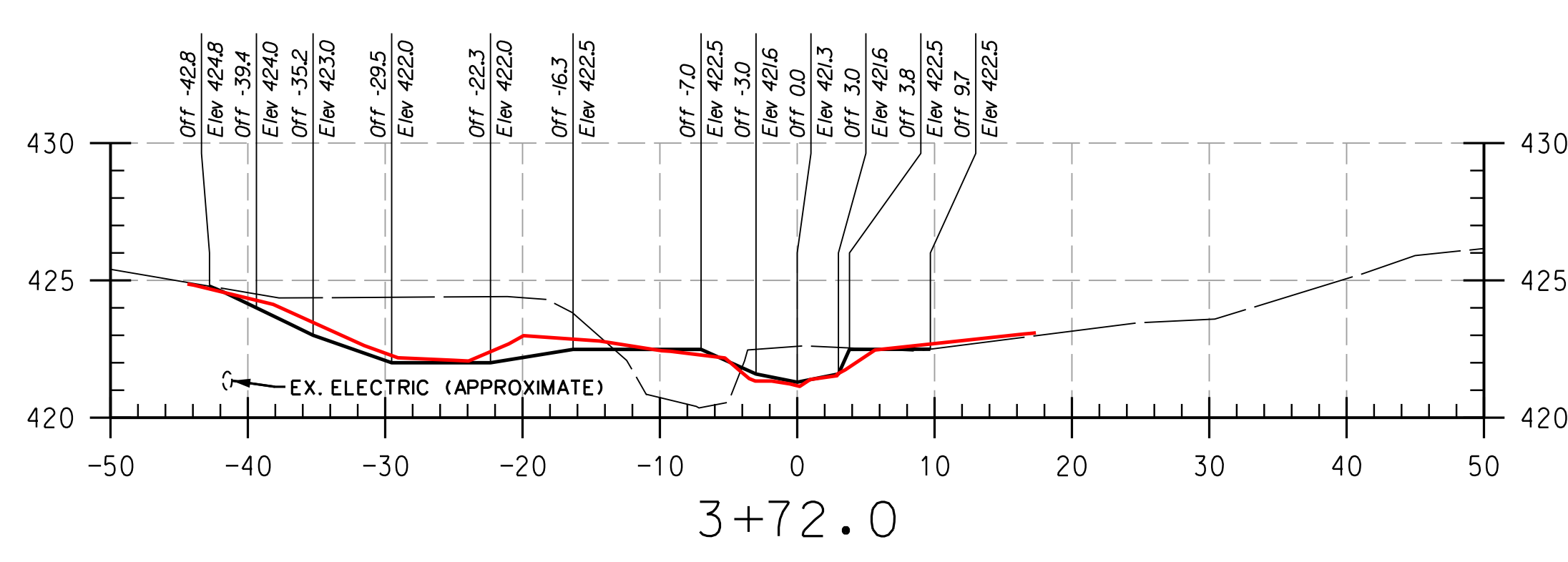
HOWARD COMMUNITY COLLEGE
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 47, 81 TAX MAP 35.36
ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

AS-BUILT
CROSS
SECTIONS

SCALE:	HOR: 1" = 10'
	VERT: 1" = 5'
DATE:	APRIL 2017
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

PLOTTED: 12:28 PM on Monday, April 24, 2017
 BY: Division
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EXPIRATION DATE: JANUARY 06, 2018



REACH 1

LEGEND

EXISTING GRADE	—
PROPOSED GRADE	—
AS-BUILT GRADE	—

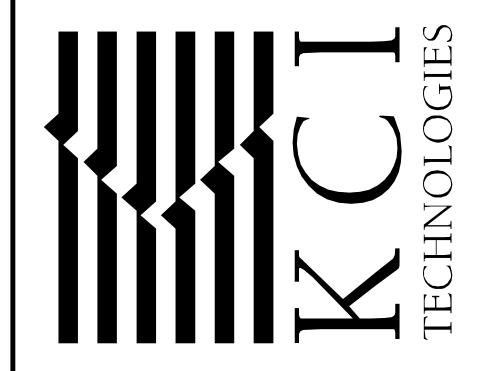
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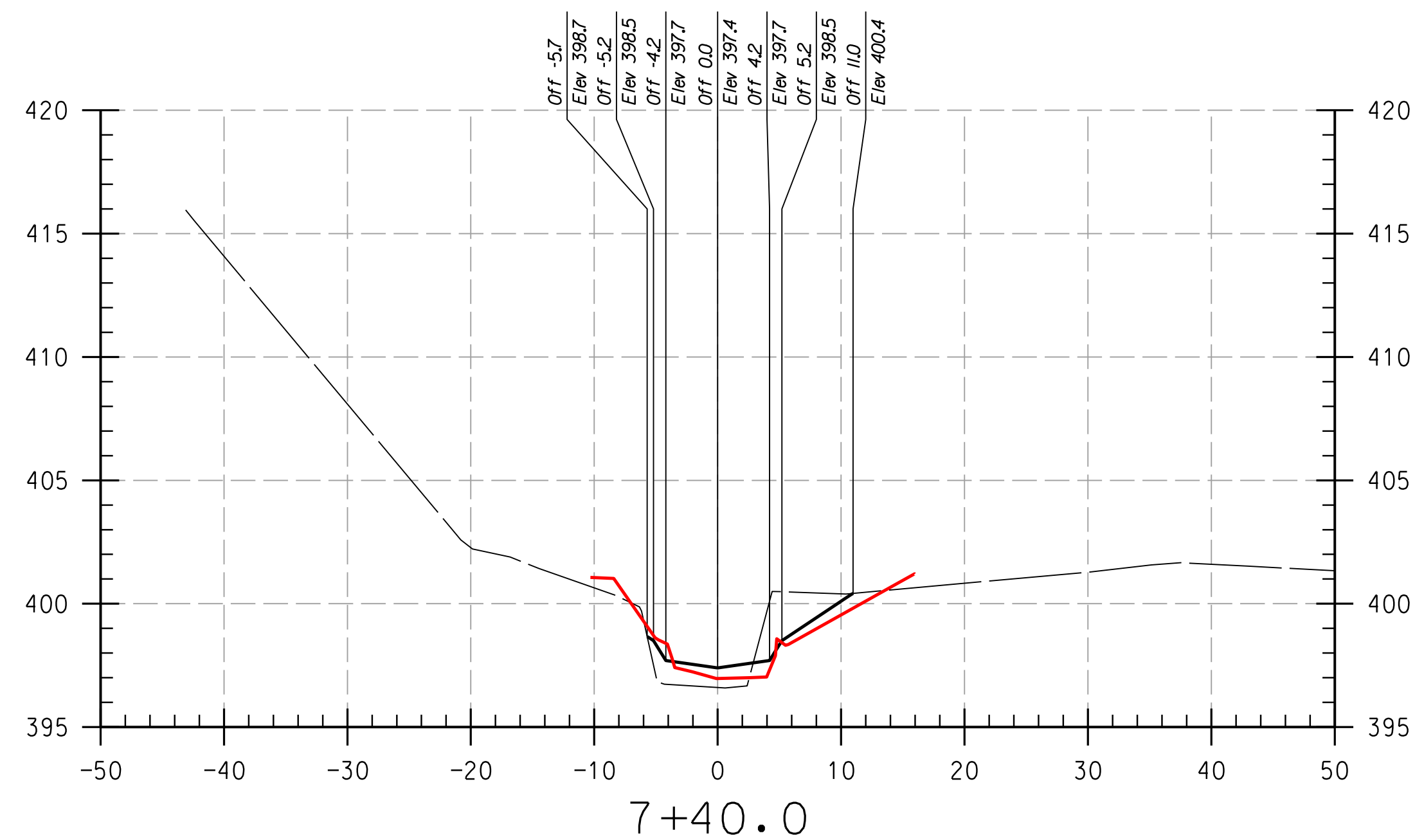
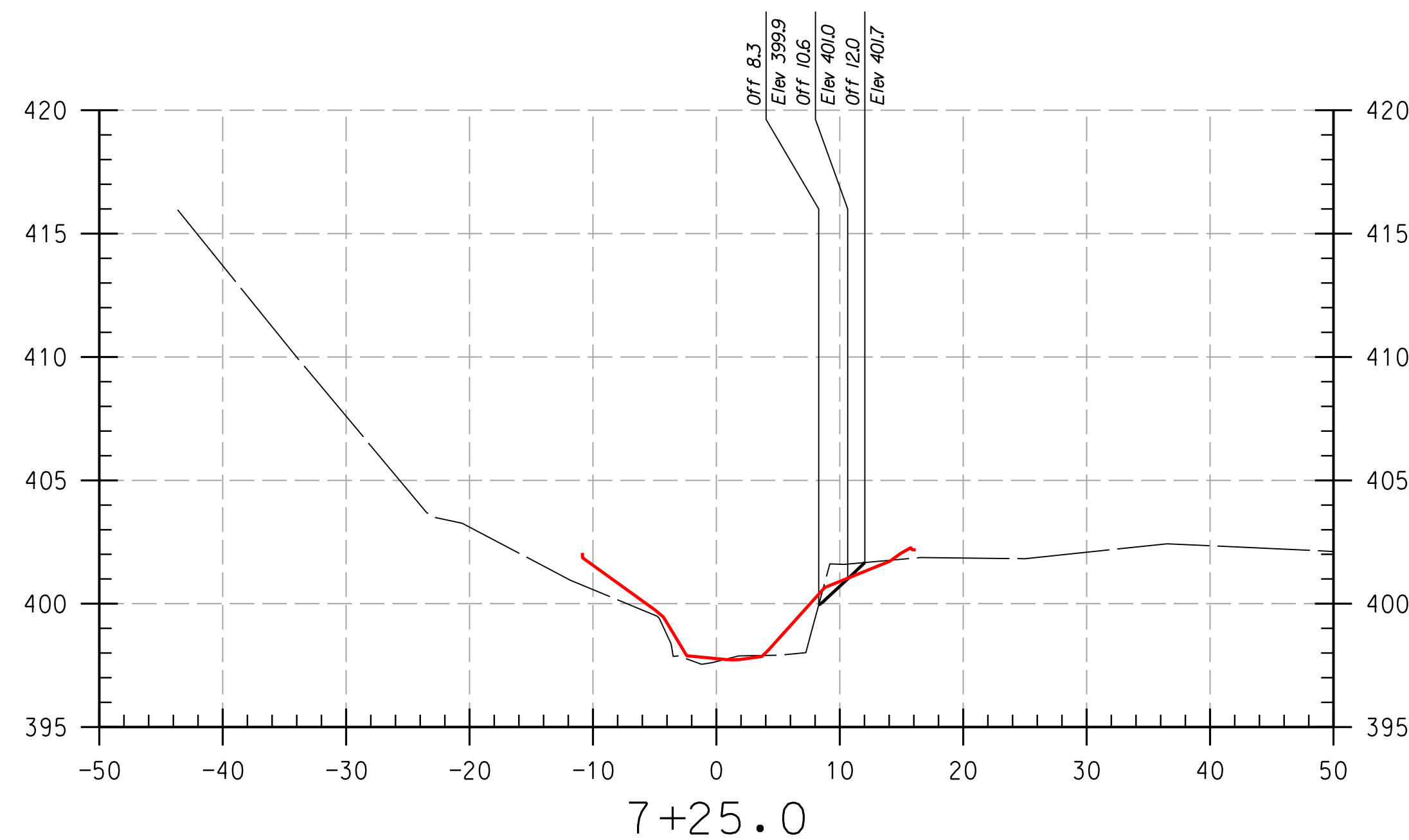
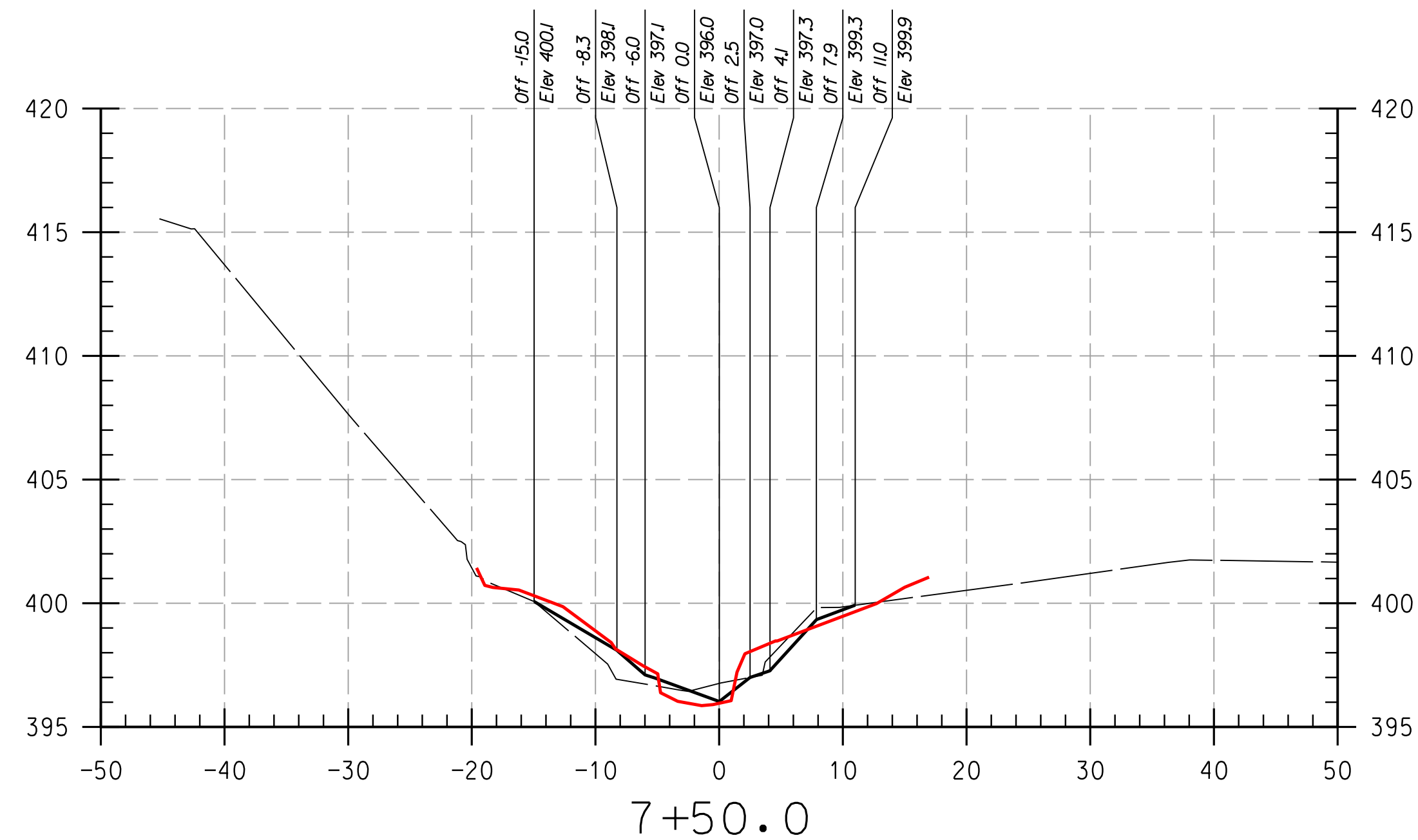
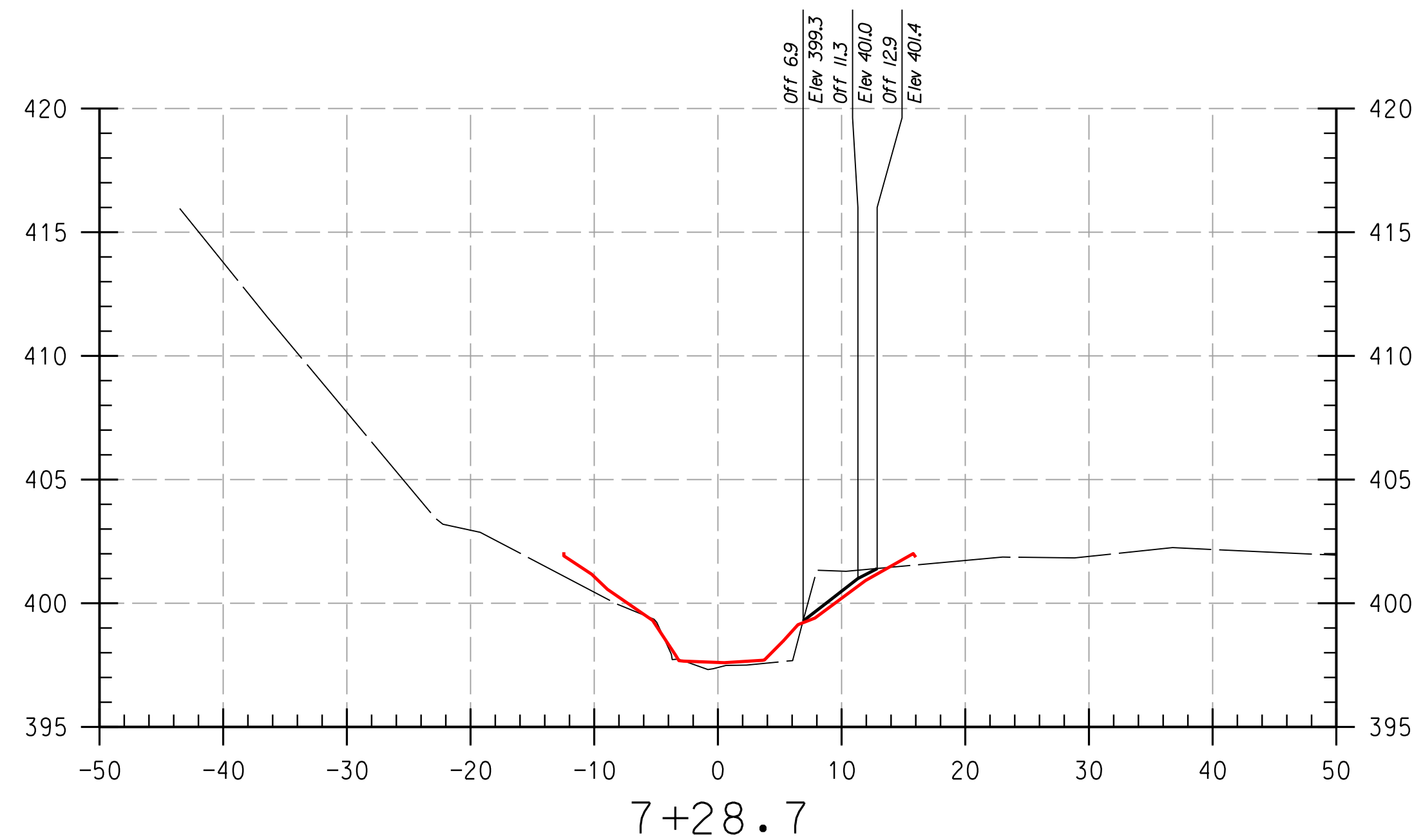
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AS-BUILT
 CROSS
 SECTIONS

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DATE:	APRIL 2017
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

PLotted: 11:22:28 PM on Monday, April 24, 2017
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 EXPIRATION DATE: JANUARY 06, 2018



REACH 2

LEGEND
 EXISTING GRADE ————
 PROPOSED GRADE ————
 AS-BUILT GRADE ————

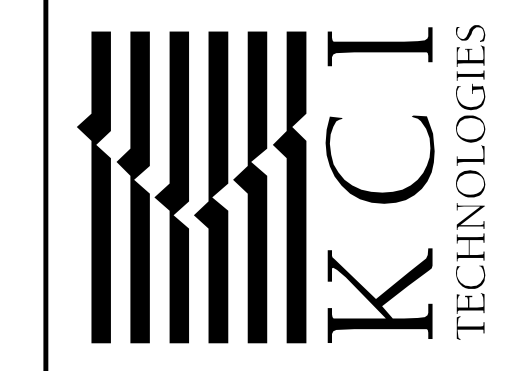
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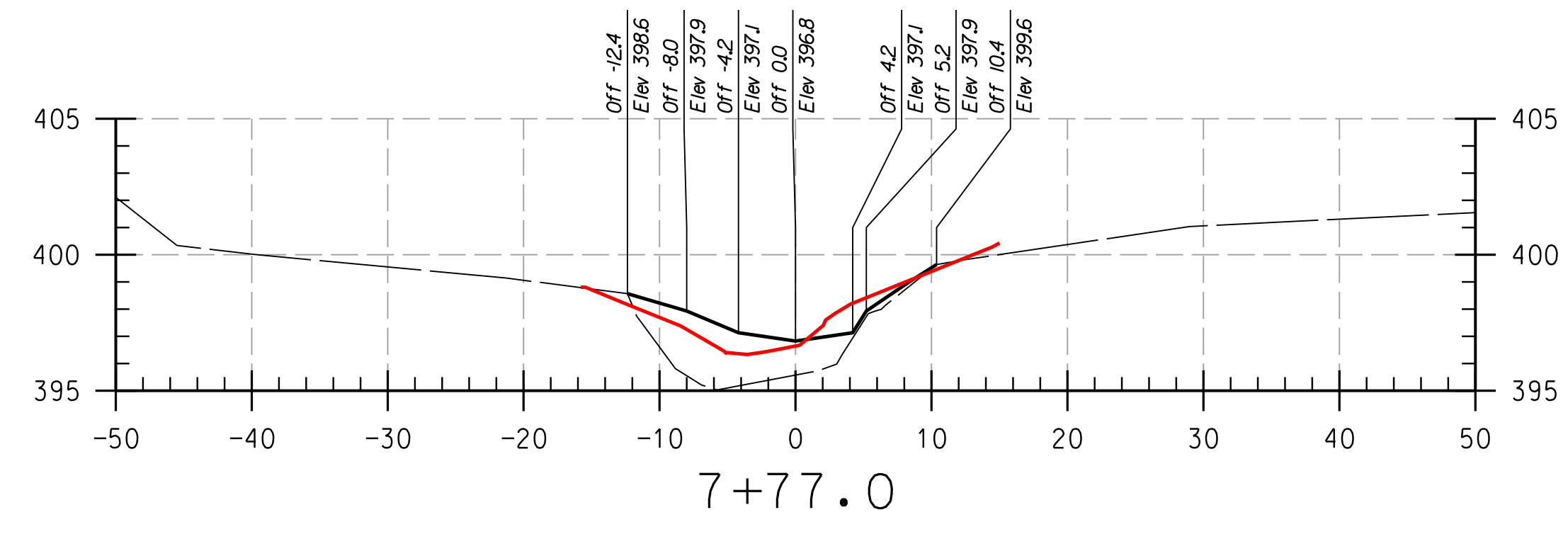
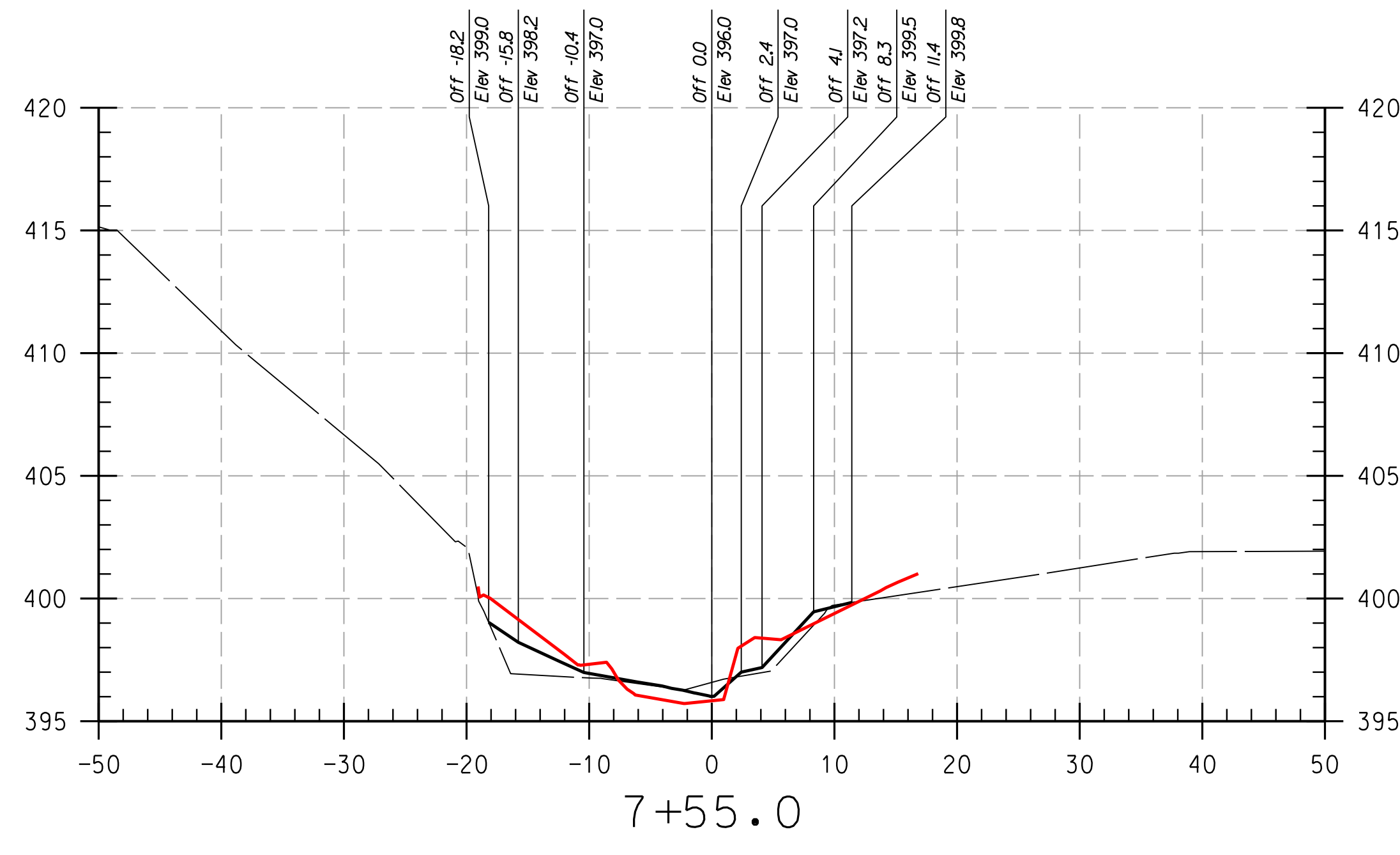
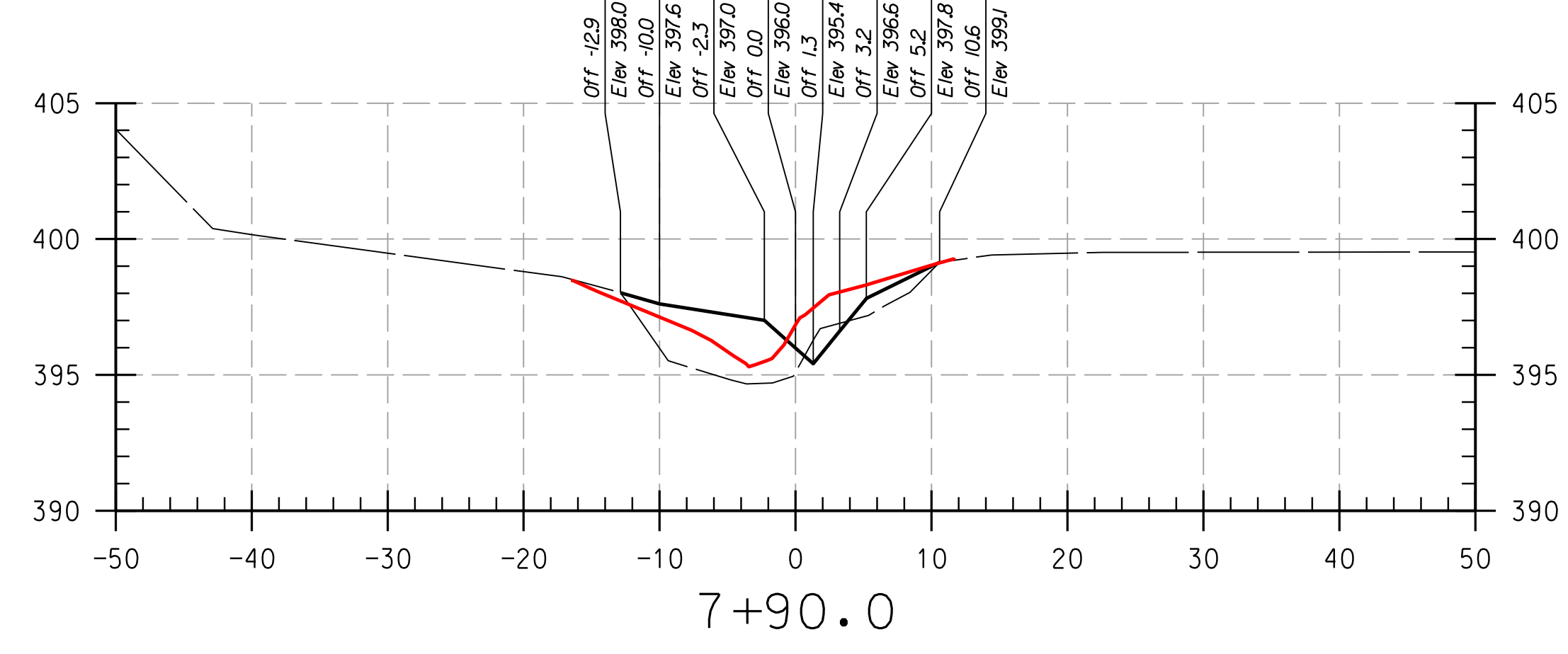
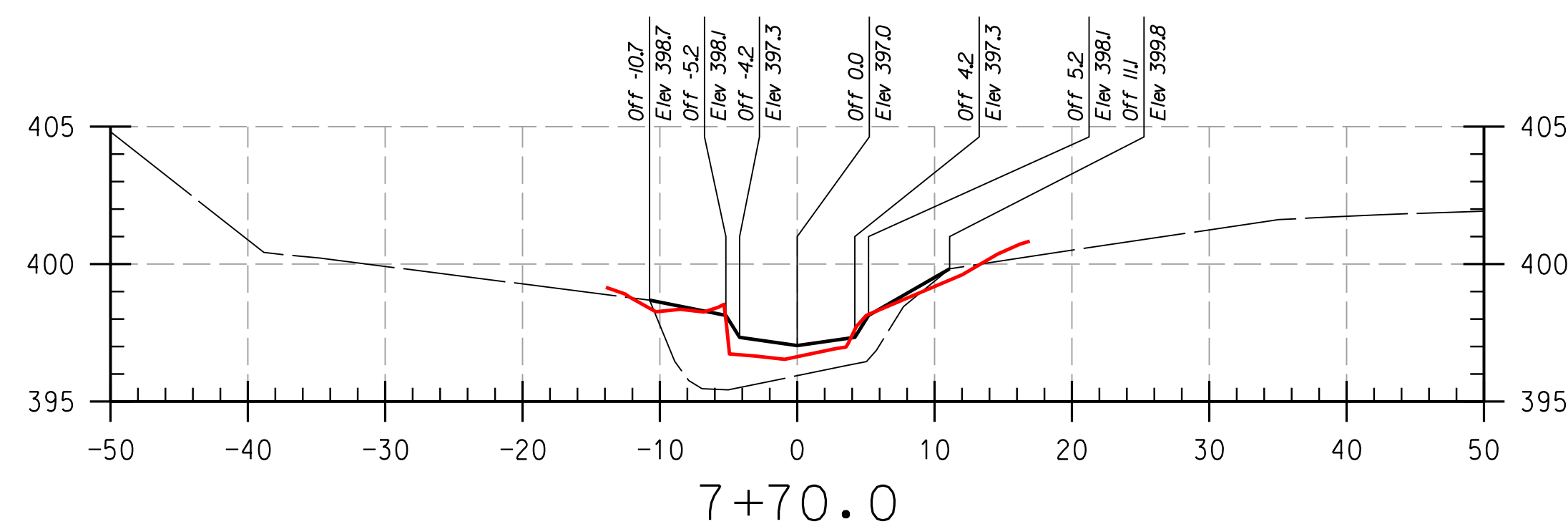
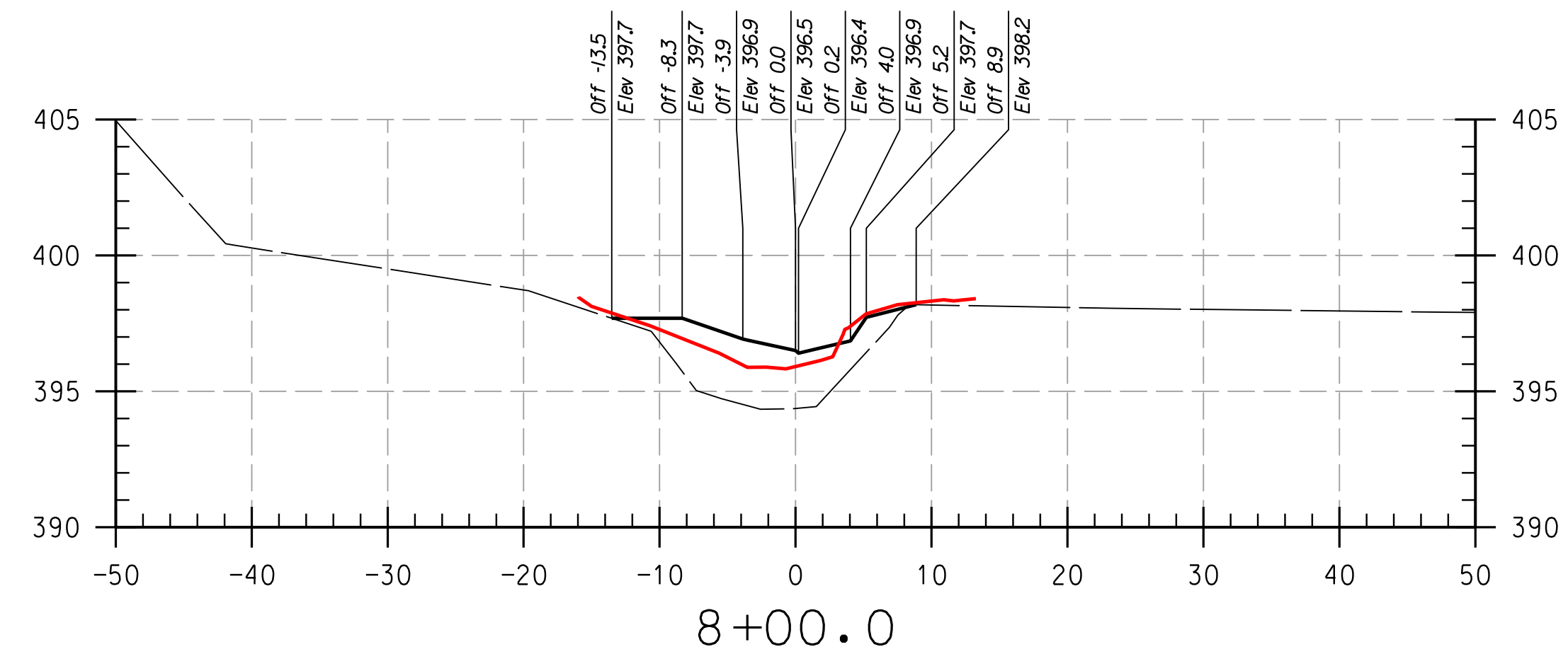
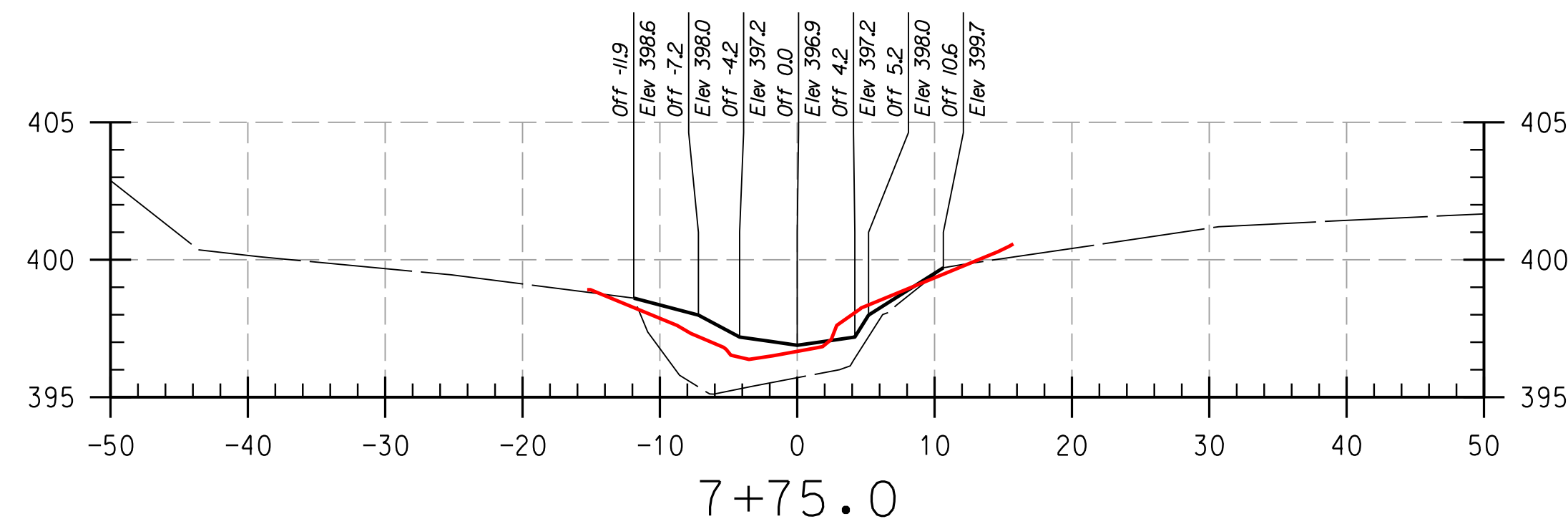


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 CAPITAL PROJECT D-1158
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AS-BUILT CROSS SECTIONS

SCALE: HOR: 1" = 10'
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 PERMIT ISSUE:
 CONSTRUCTION ISSUE:

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 BY: Division
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REACH 2

LEGEND

EXISTING GRADE	
PROPOSED GRADE	
AS-BUILT GRADE	

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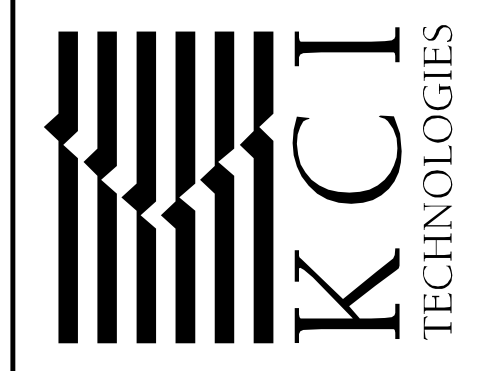
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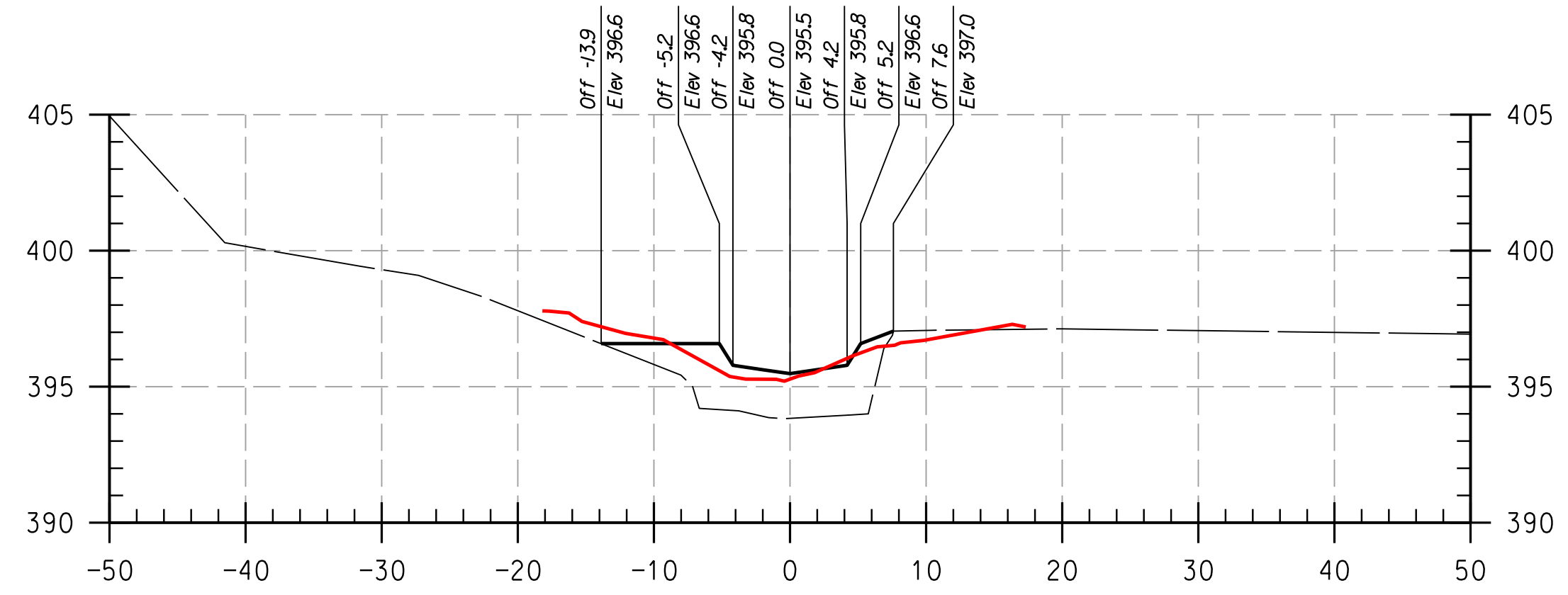
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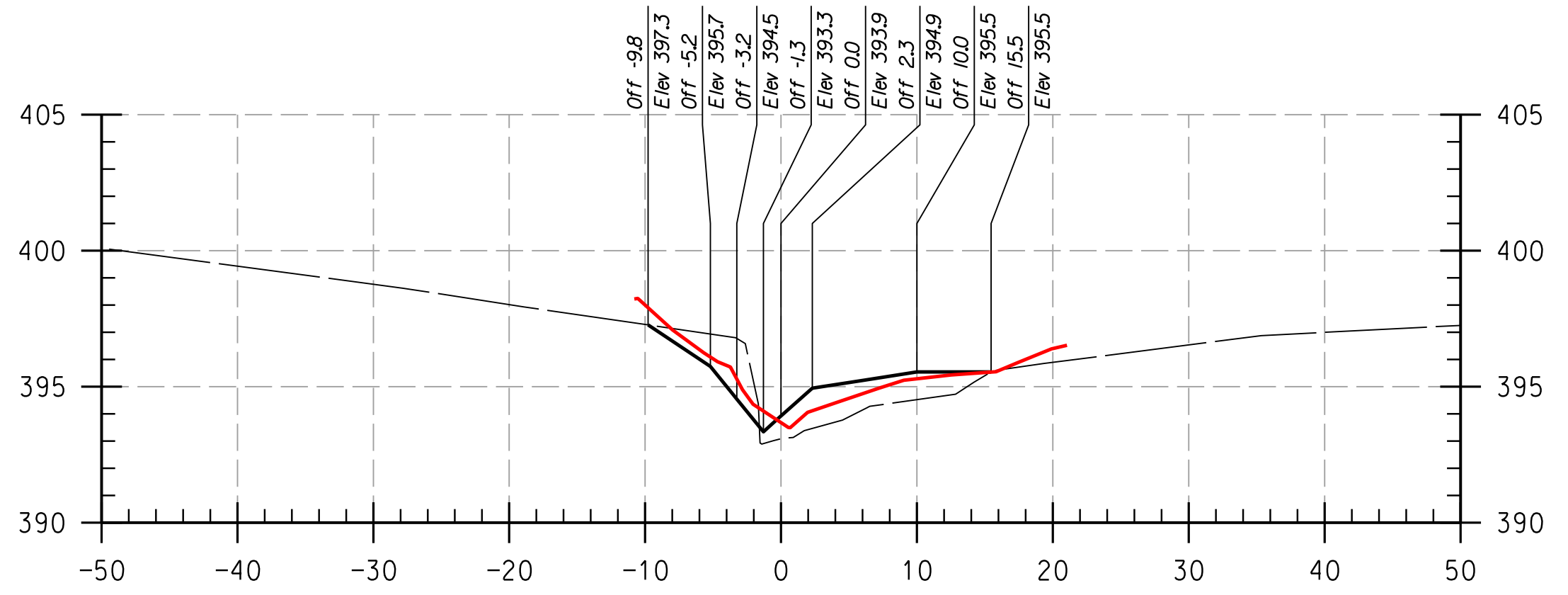
HOWARD COMMUNITY COLLEGE
 STREAM RESTORATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
 STORMWATER MANAGEMENT DIVISION
 6751 COLUMBIA GATEWAY DRIVE
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 PARCELS 47, 81 TAX MAP 35.36
 ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

AS-BUILT
 CROSS
 SECTIONS

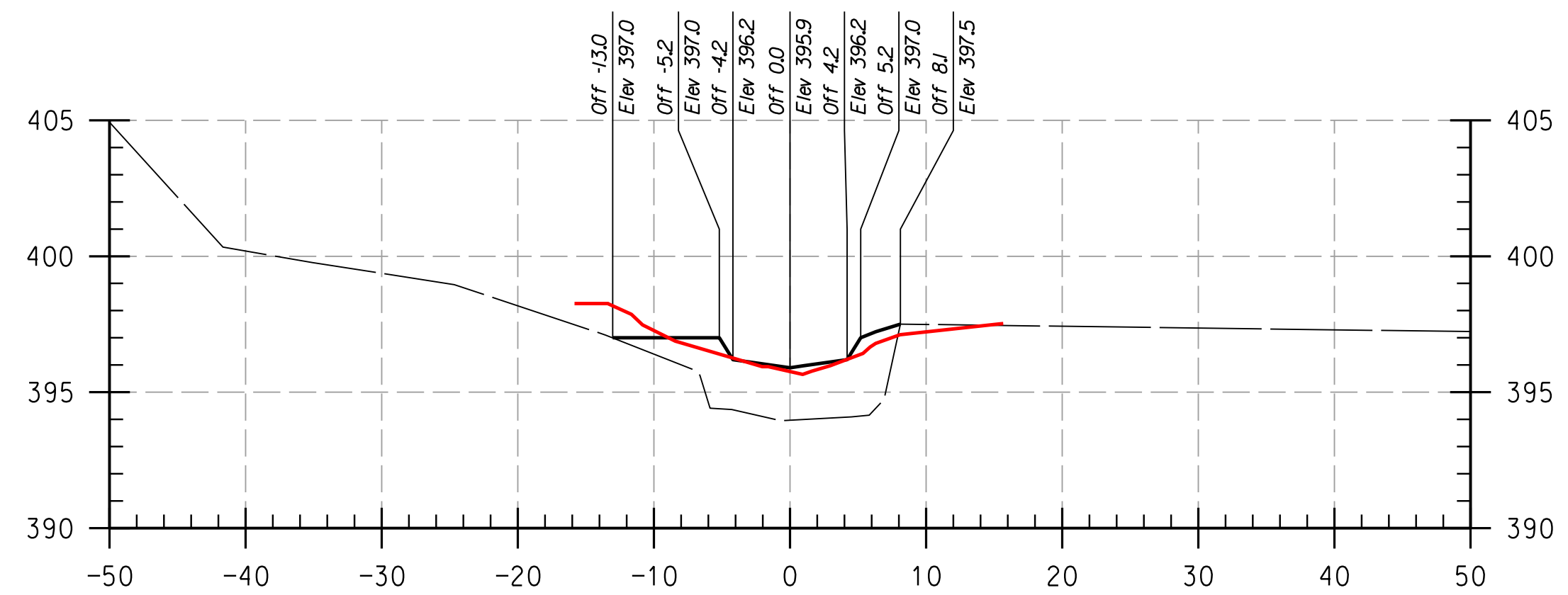
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KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	



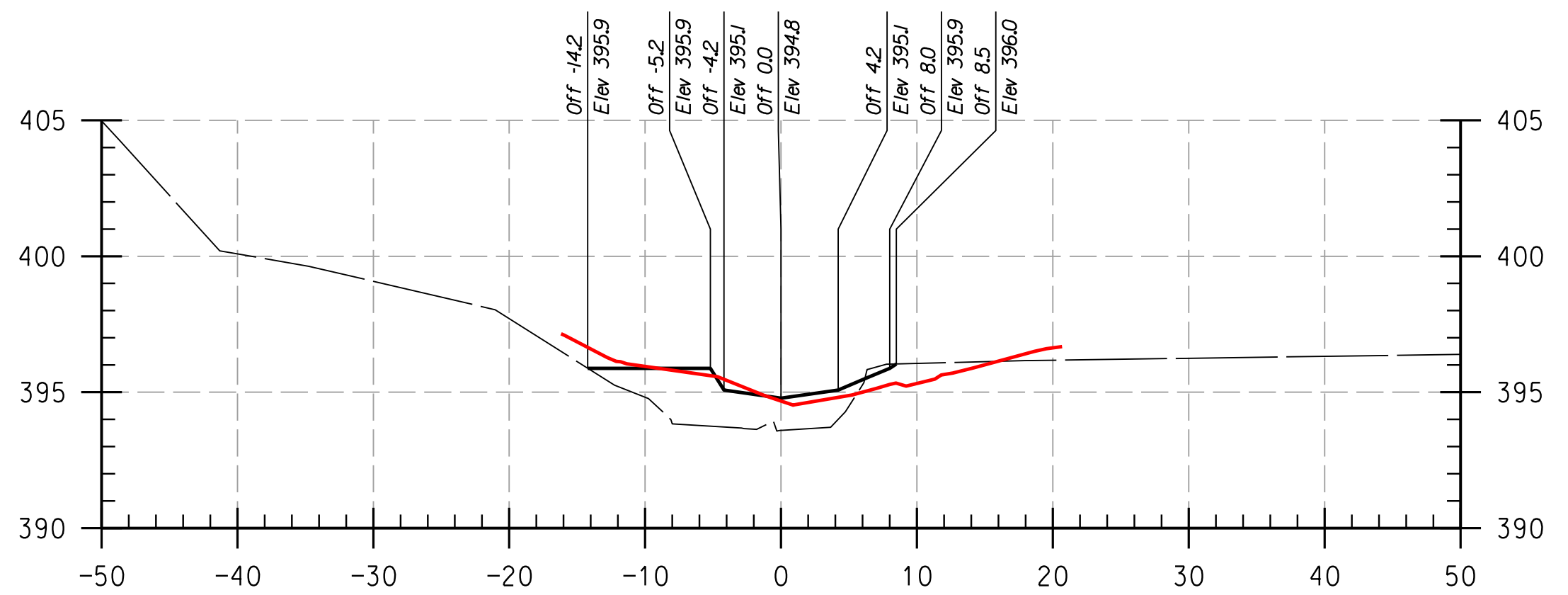
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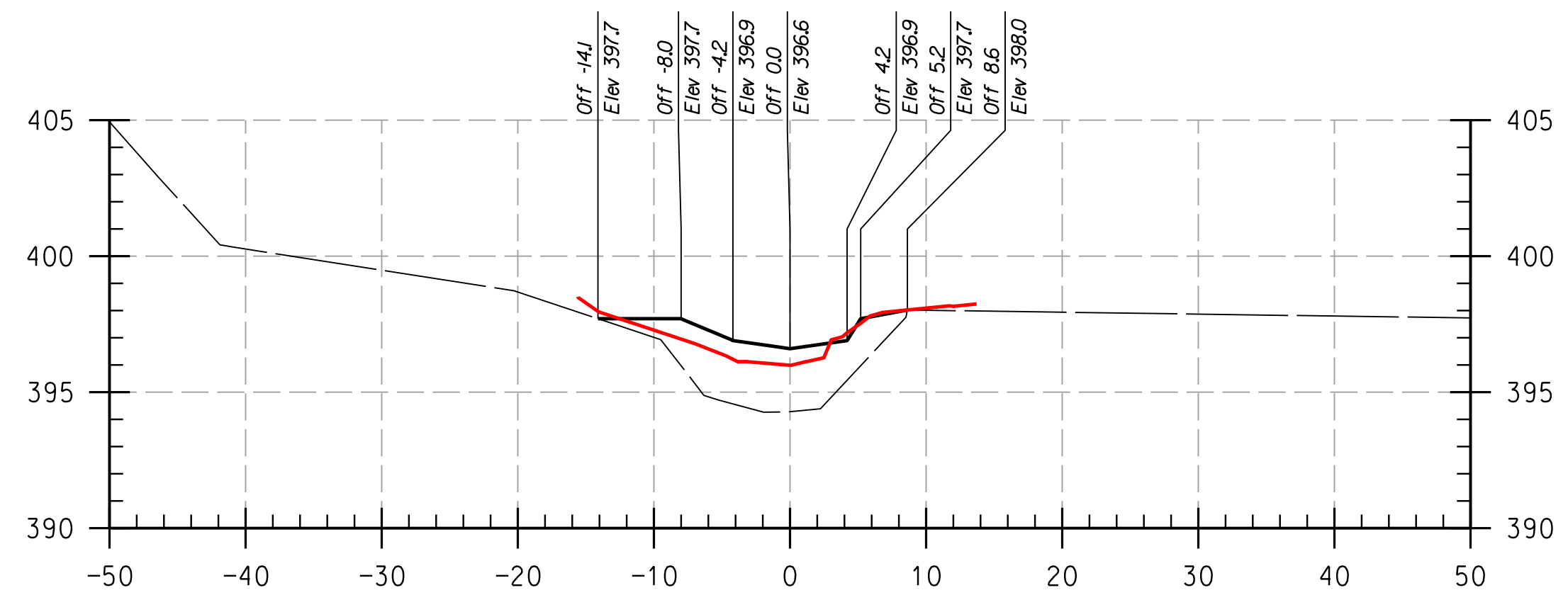
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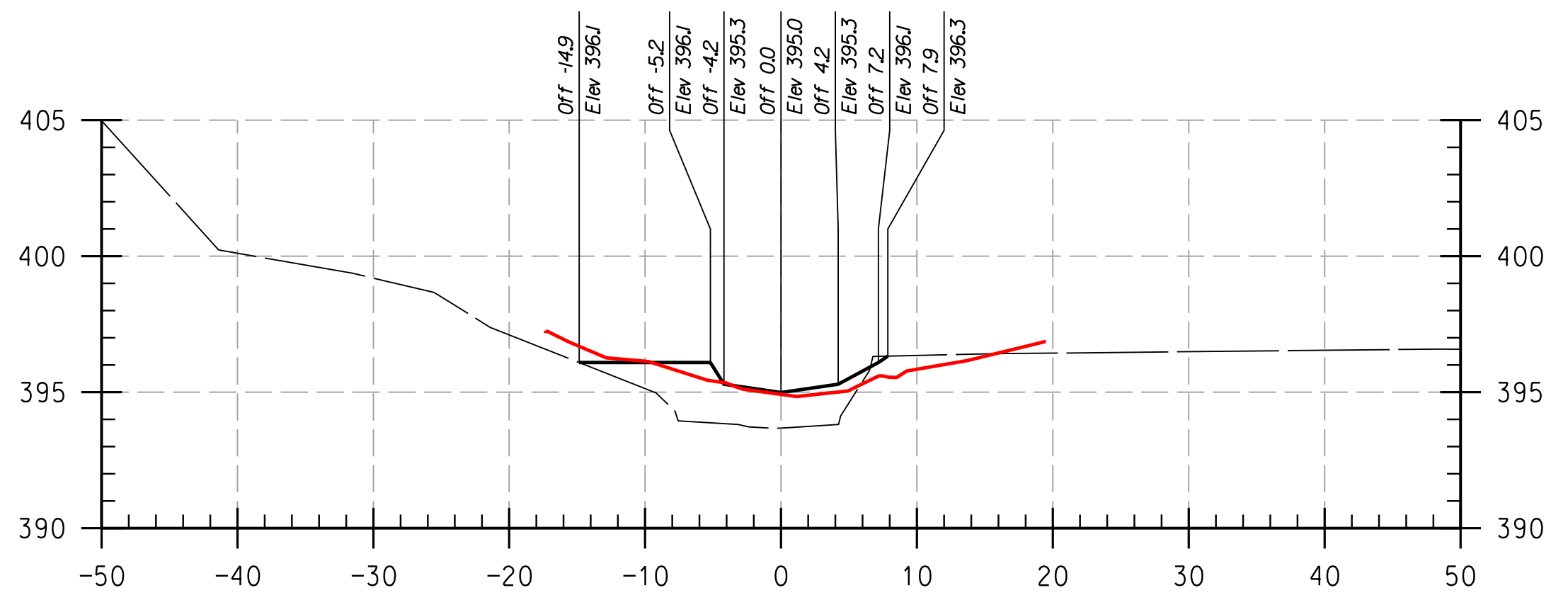
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8+28.0

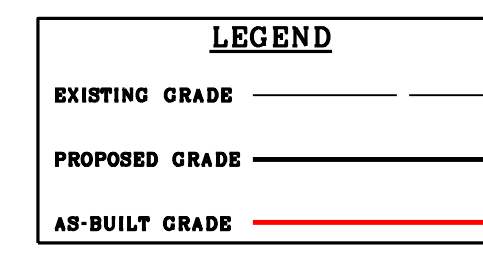


8+02.0



8+25.0

REACH 2



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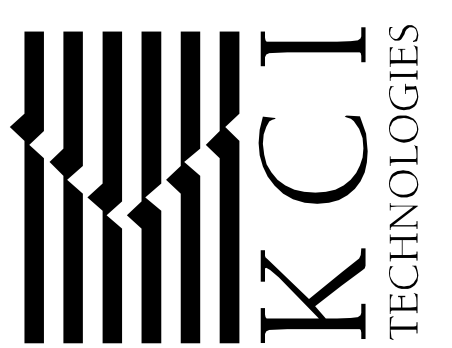
HOWARD SCD _____ DATE _____

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES _____ DATE _____

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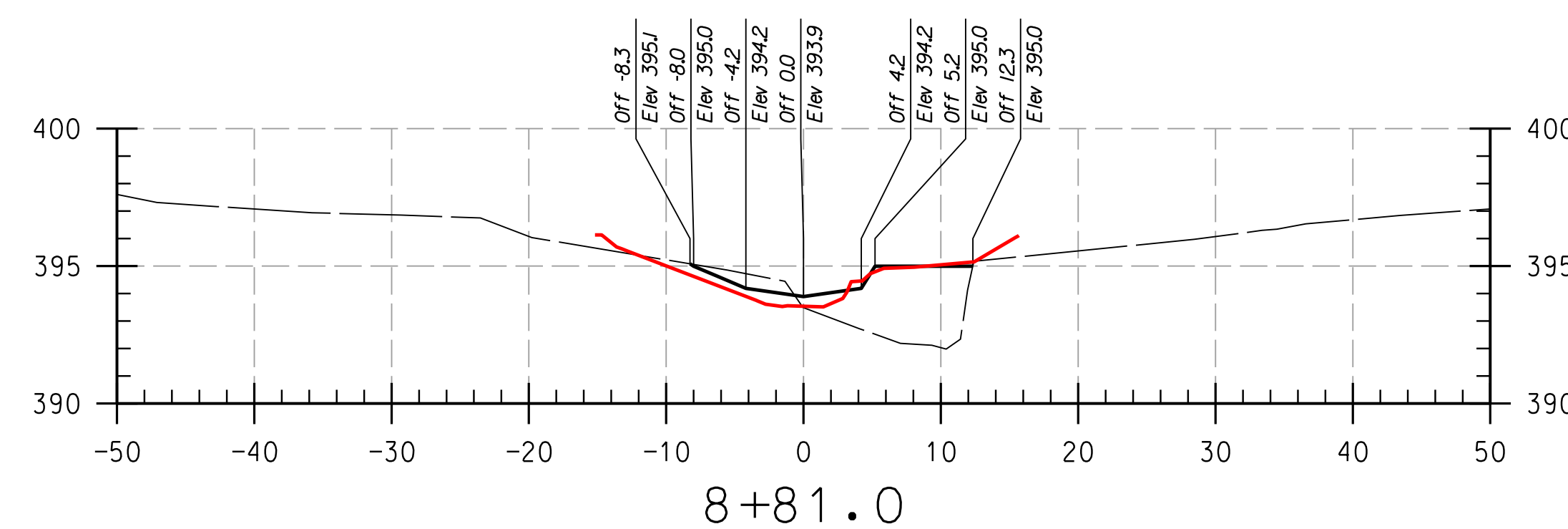
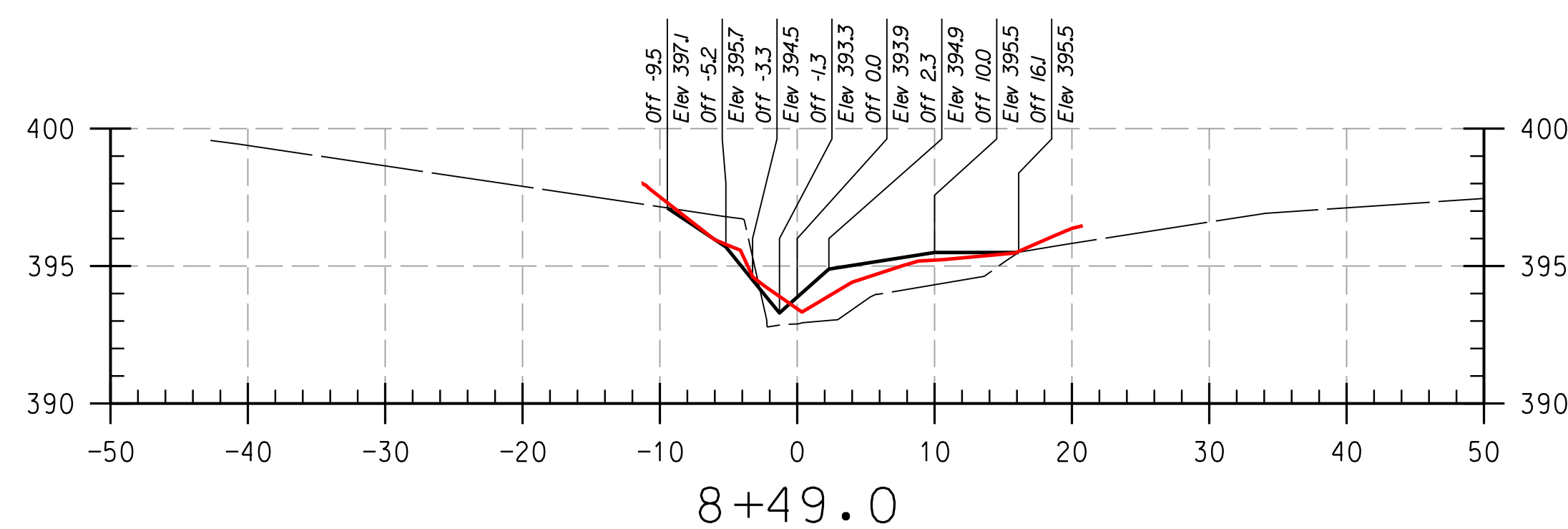
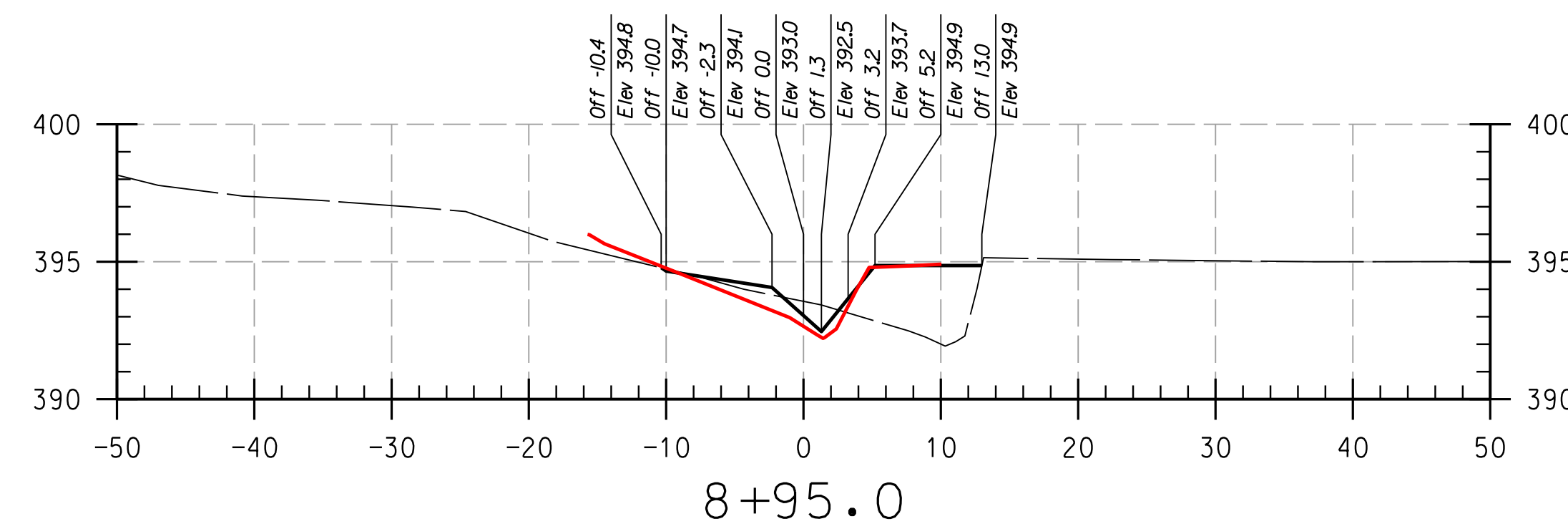
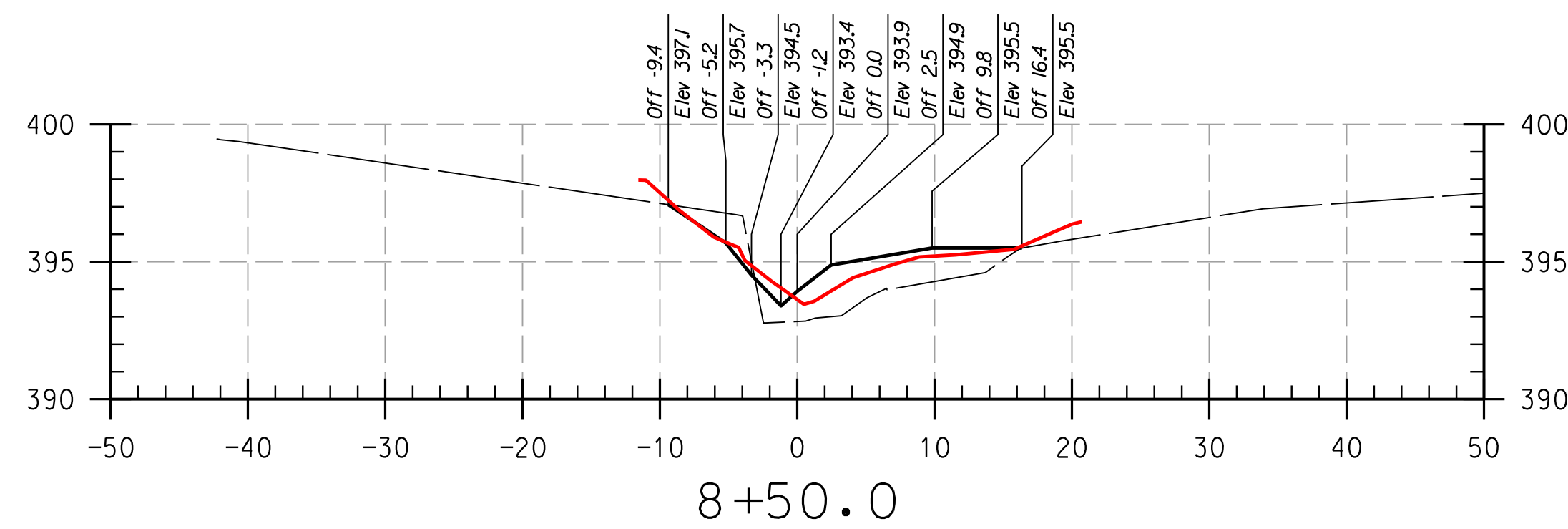
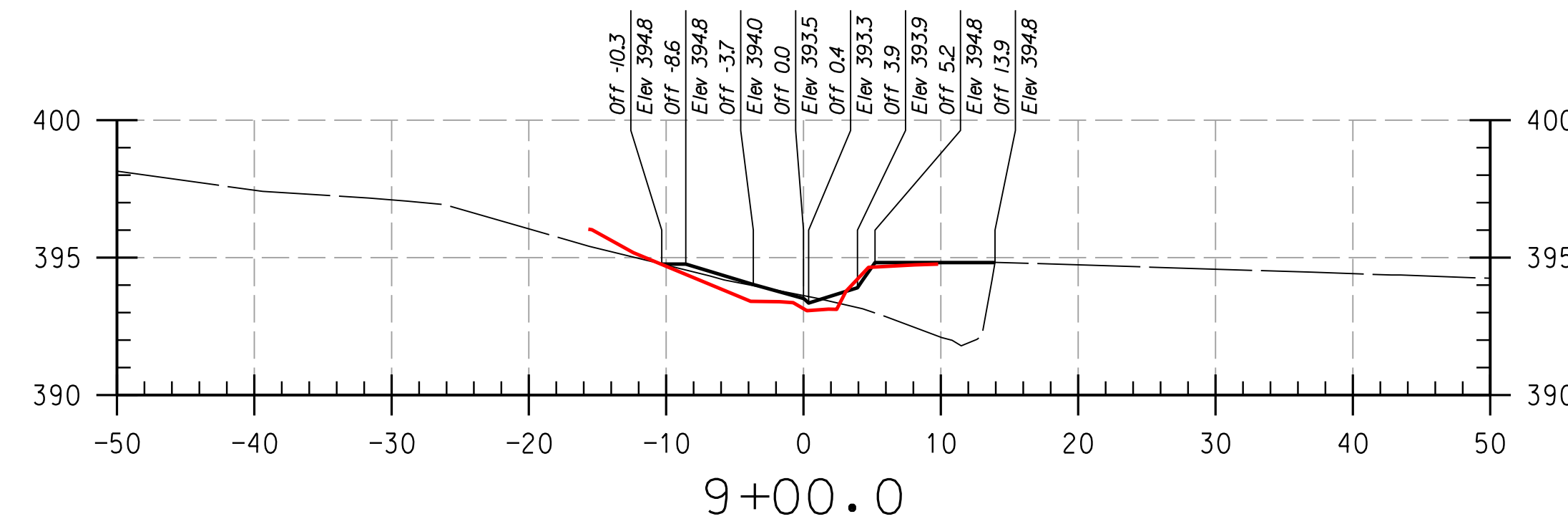
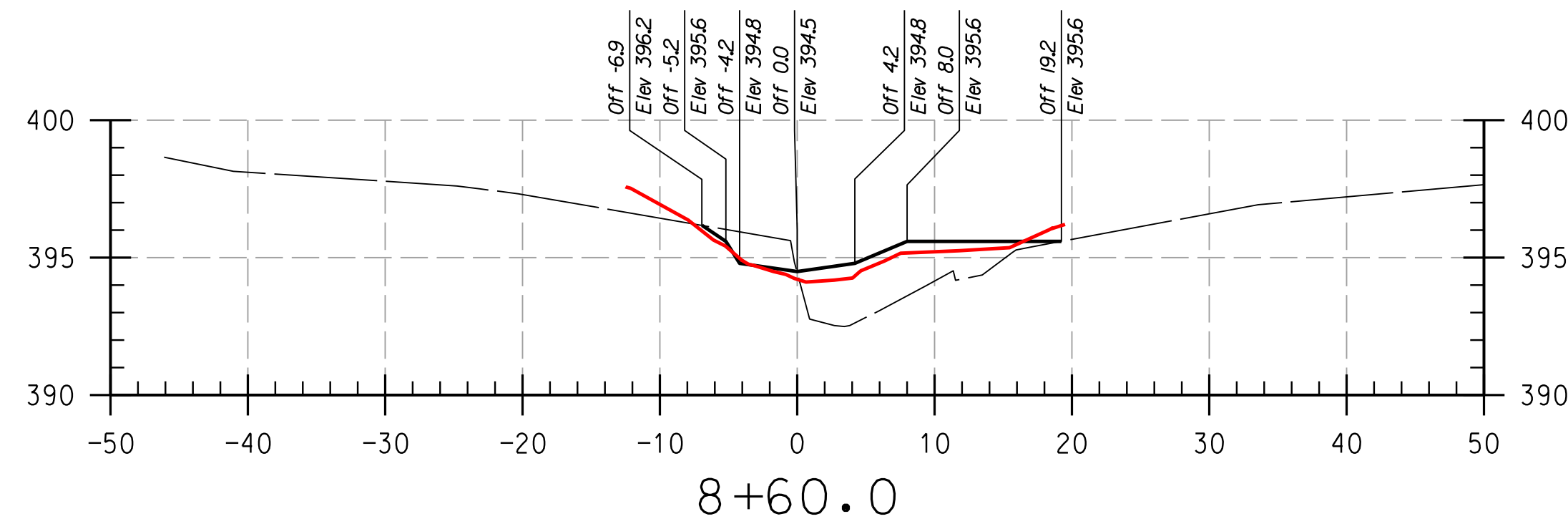
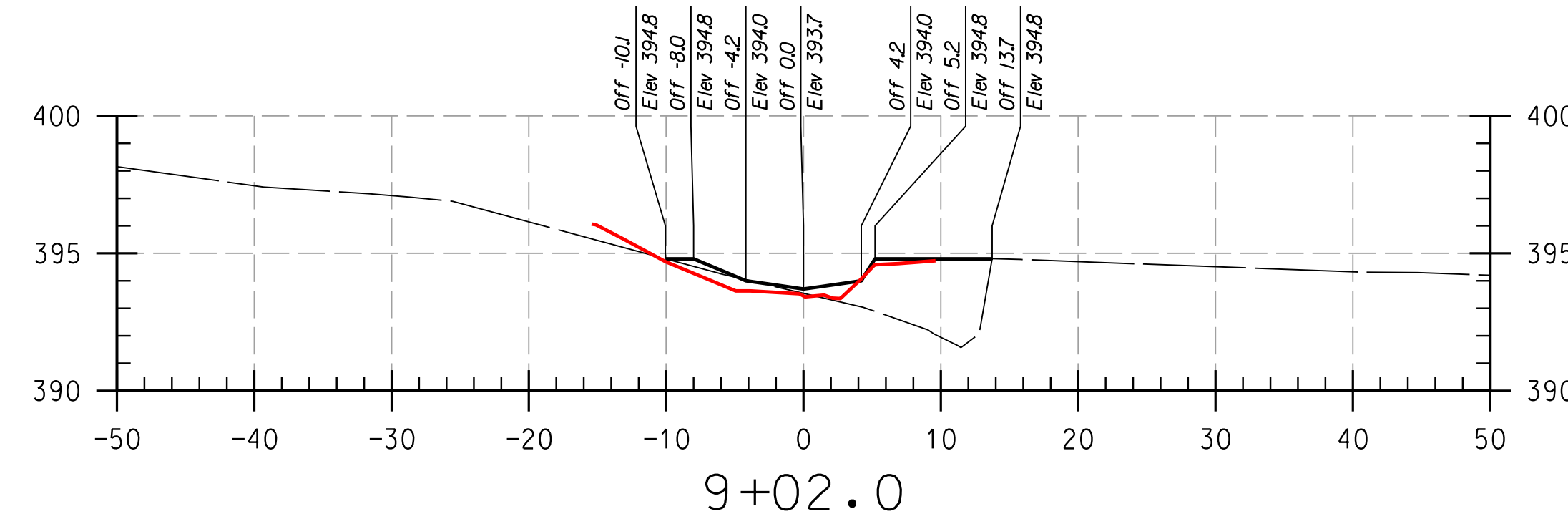
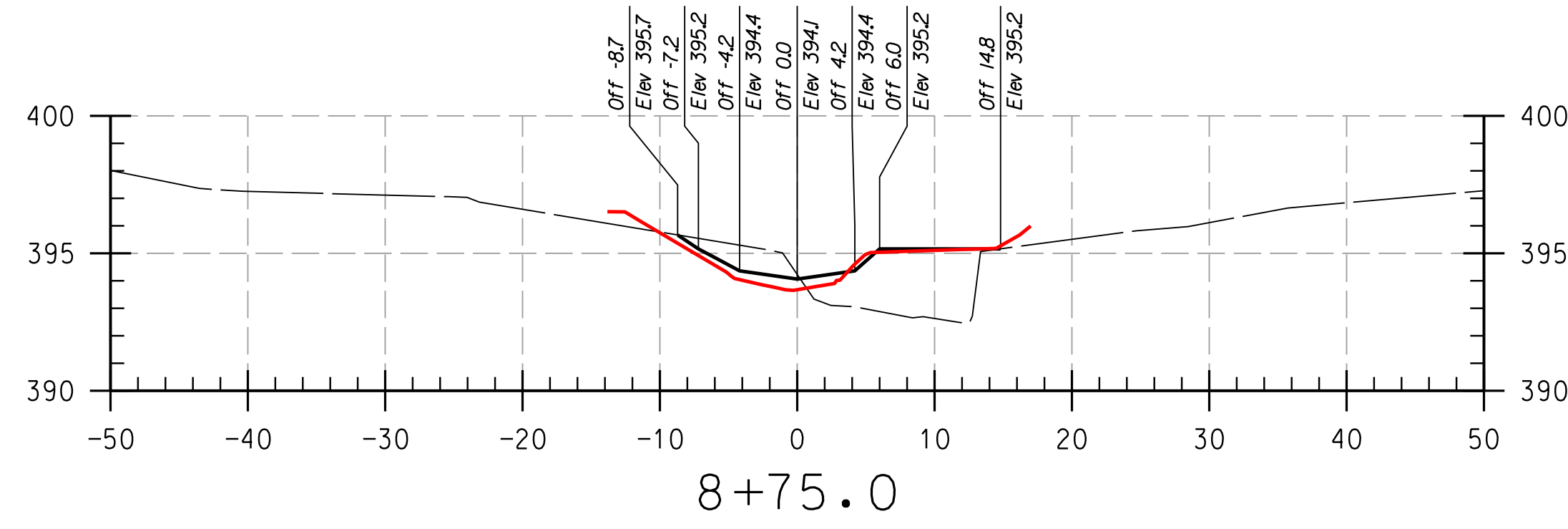
HOWARD COMMUNITY COLLEGE
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CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 47, 81 TAX MAP 35.36
ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

AS-BUILT
CROSS
SECTIONS

SCALE:	HOR: 1" = 10'
	VERT: 1" = 5'
DATE:	APRIL 2017
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

PLOTTED: 11:24:28 PM on Monday, April 24, 2017
BY: Division
FILE: C:\CAD\Drawings\Howard\CC\PS-P001-Howard CC As-Built.dgn

KCI FILE: M:\A 2013 \ 17133314.83\



LEGEND

EXISTING GRADE	---
PROPOSED GRADE	---
AS-BUILT GRADE	---

NOTE:
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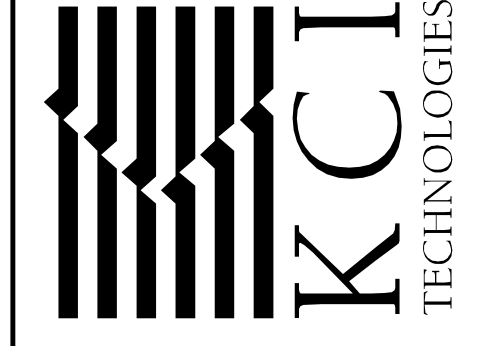
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DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES _____ DATE _____

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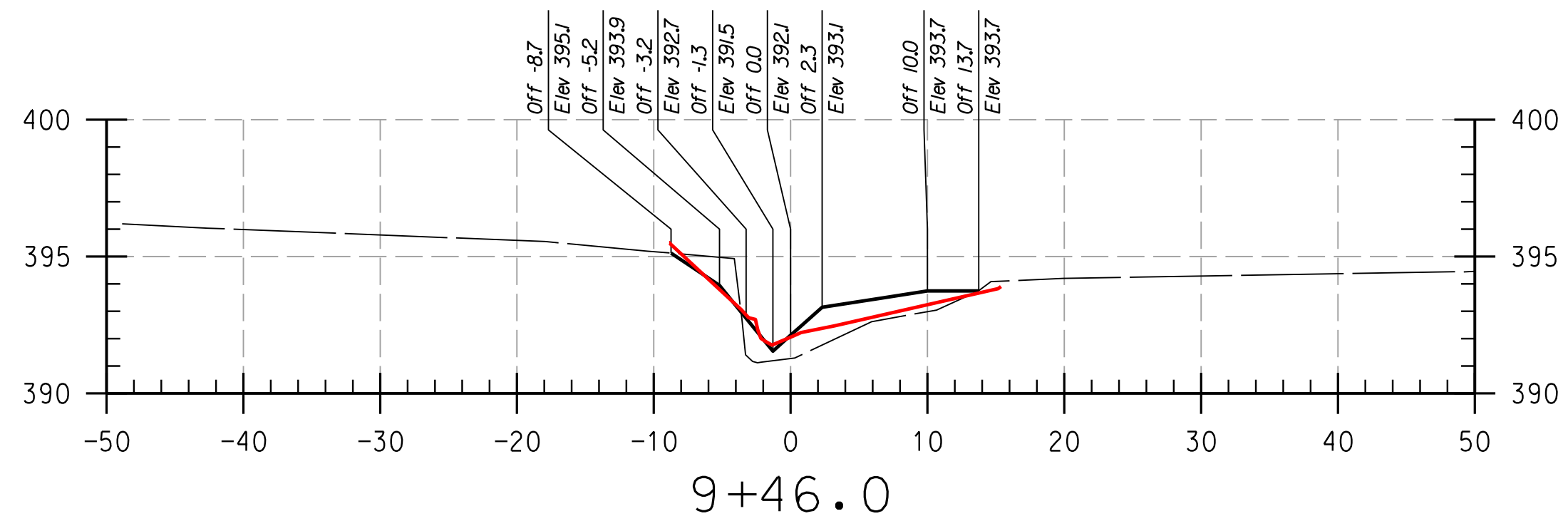
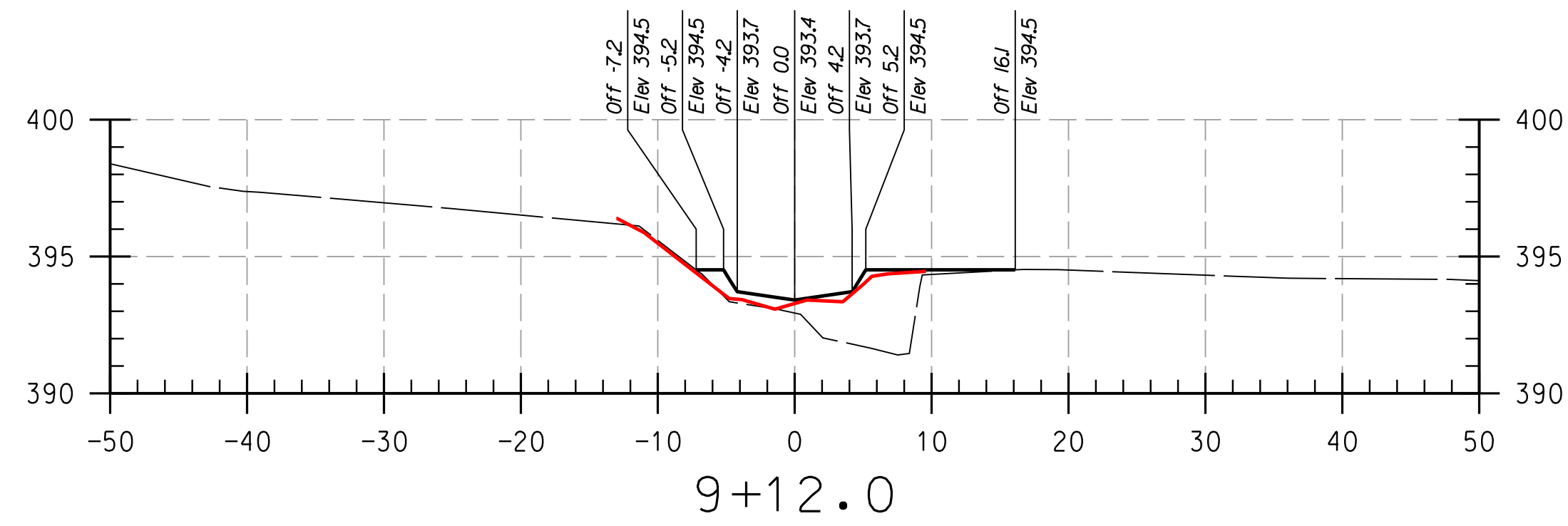
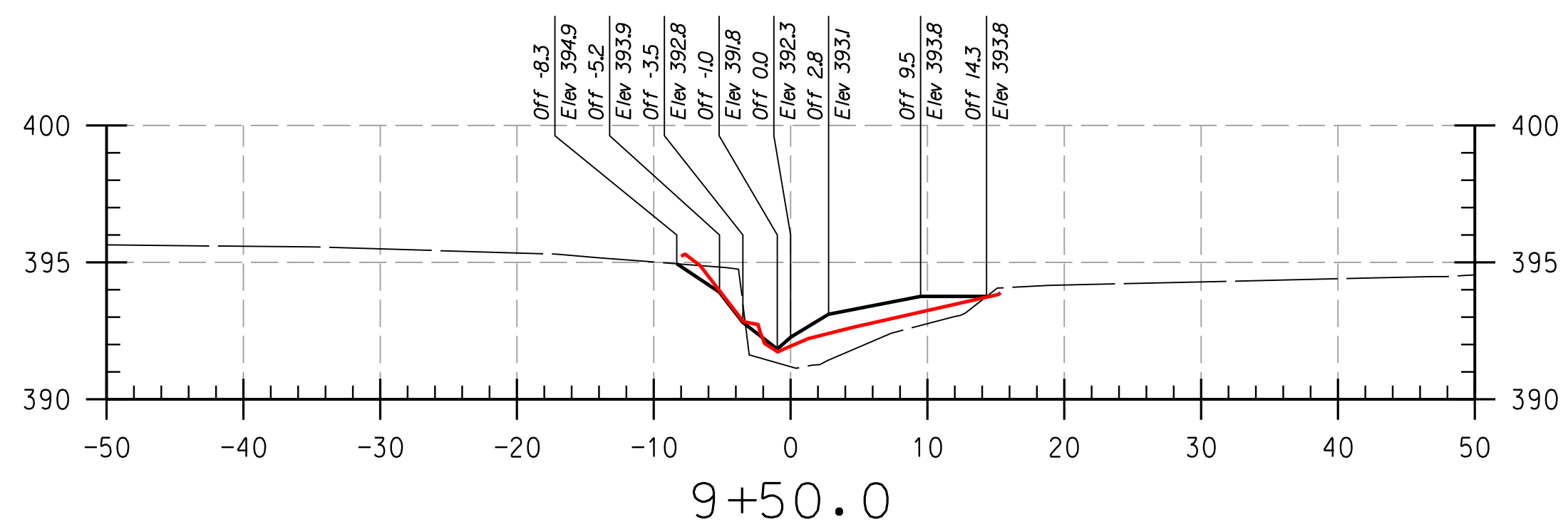
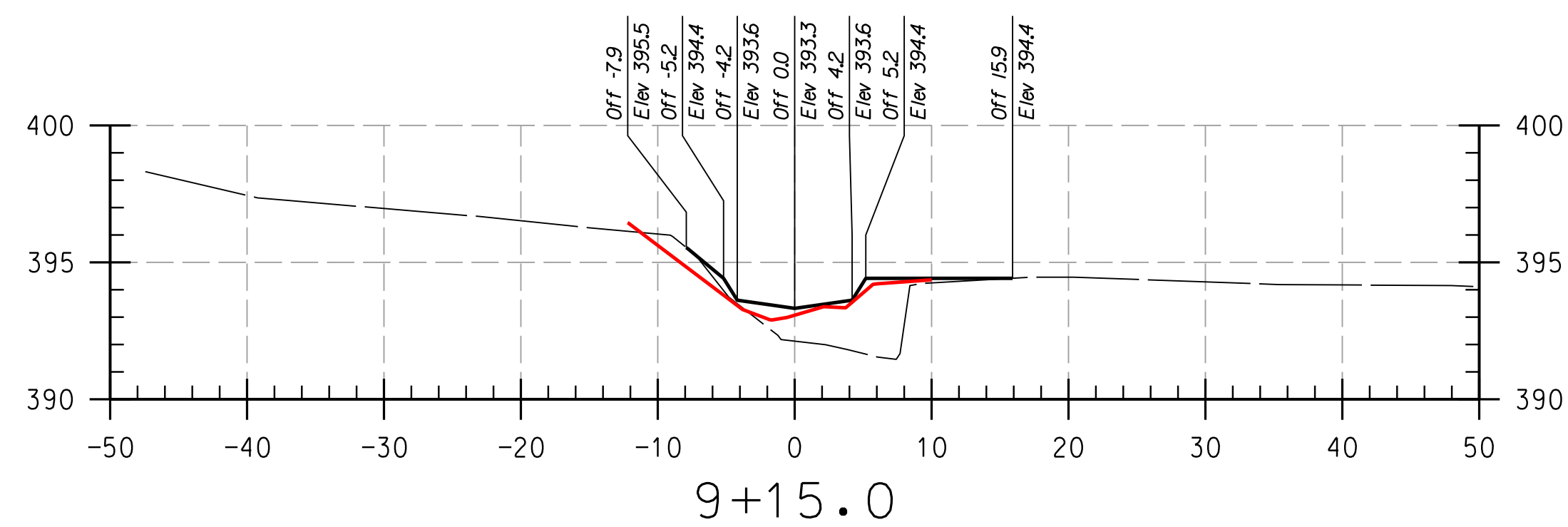
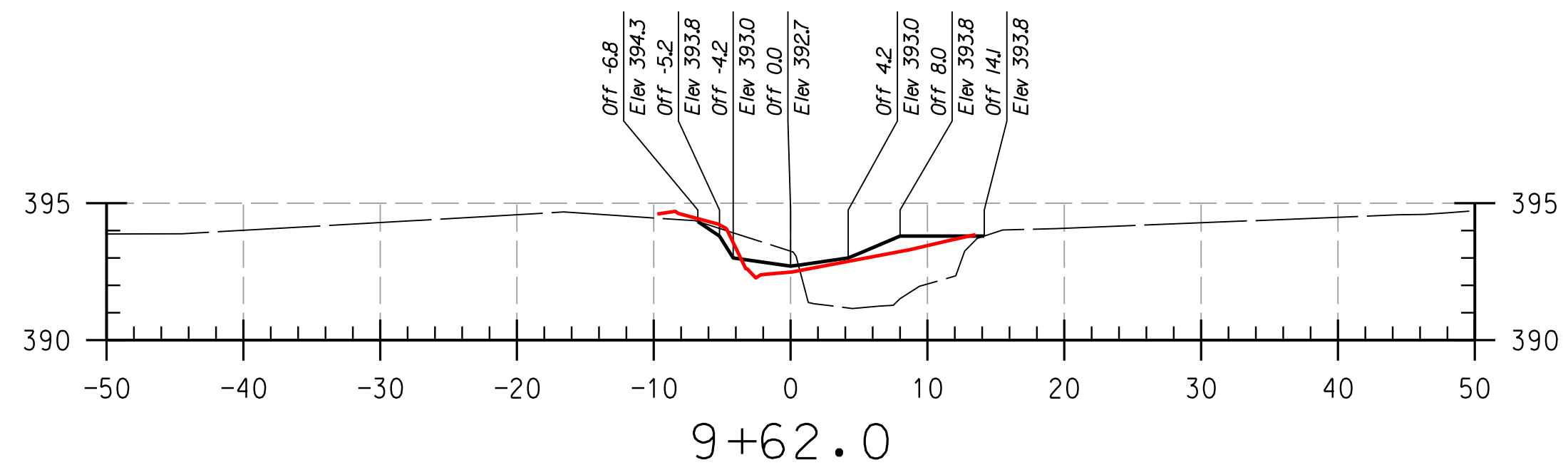
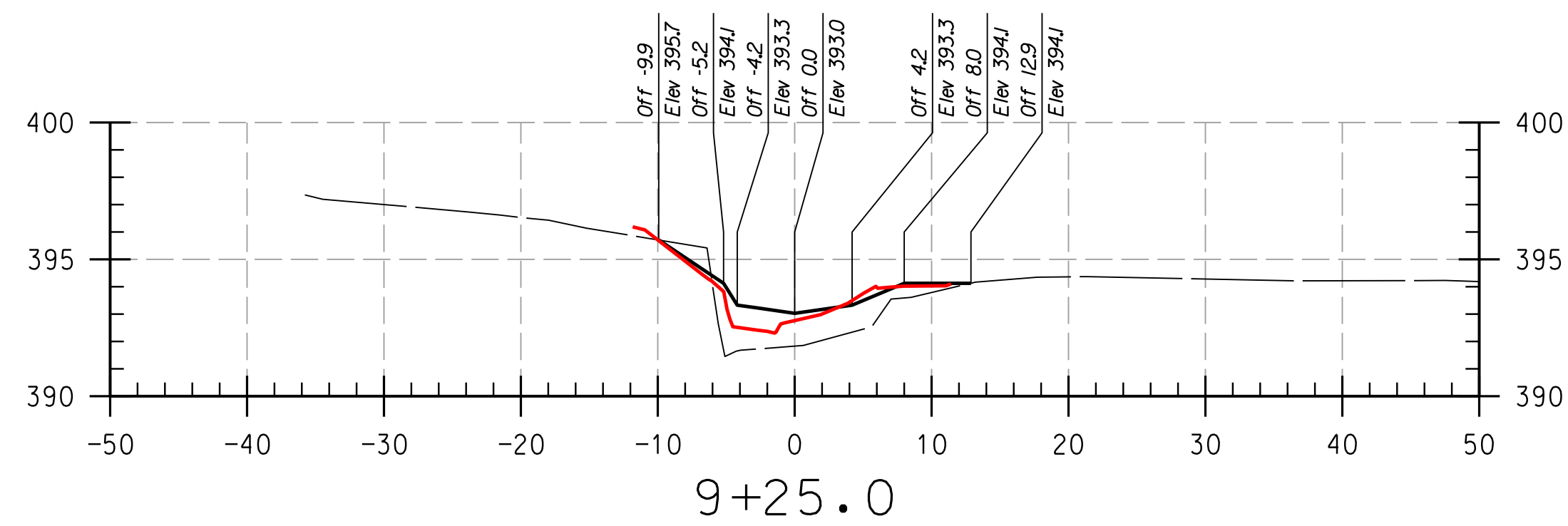
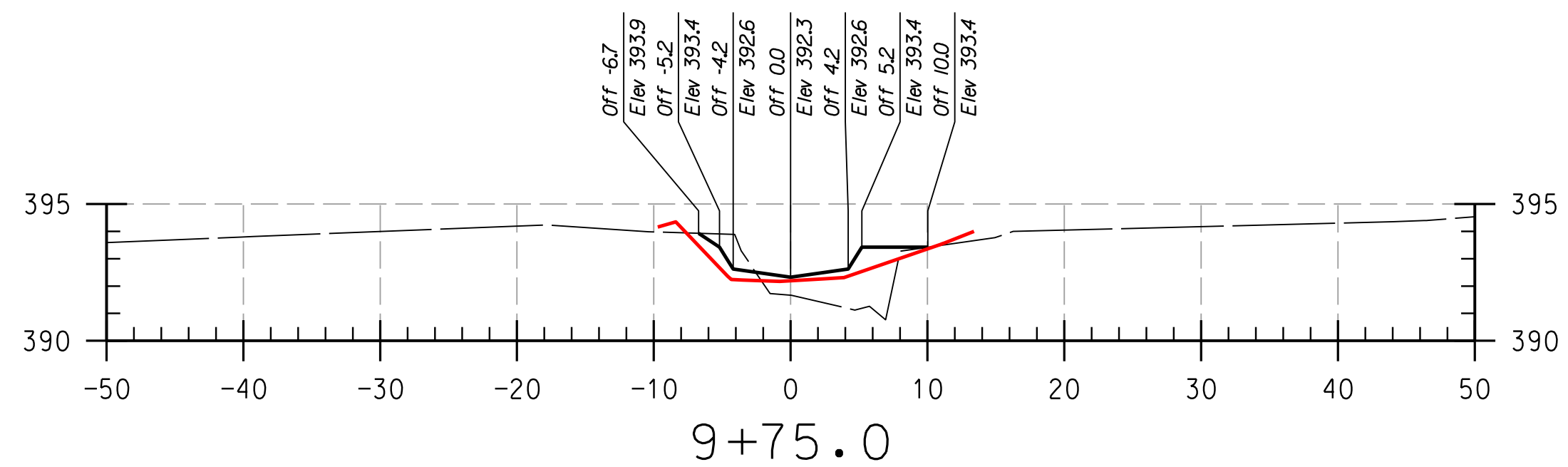
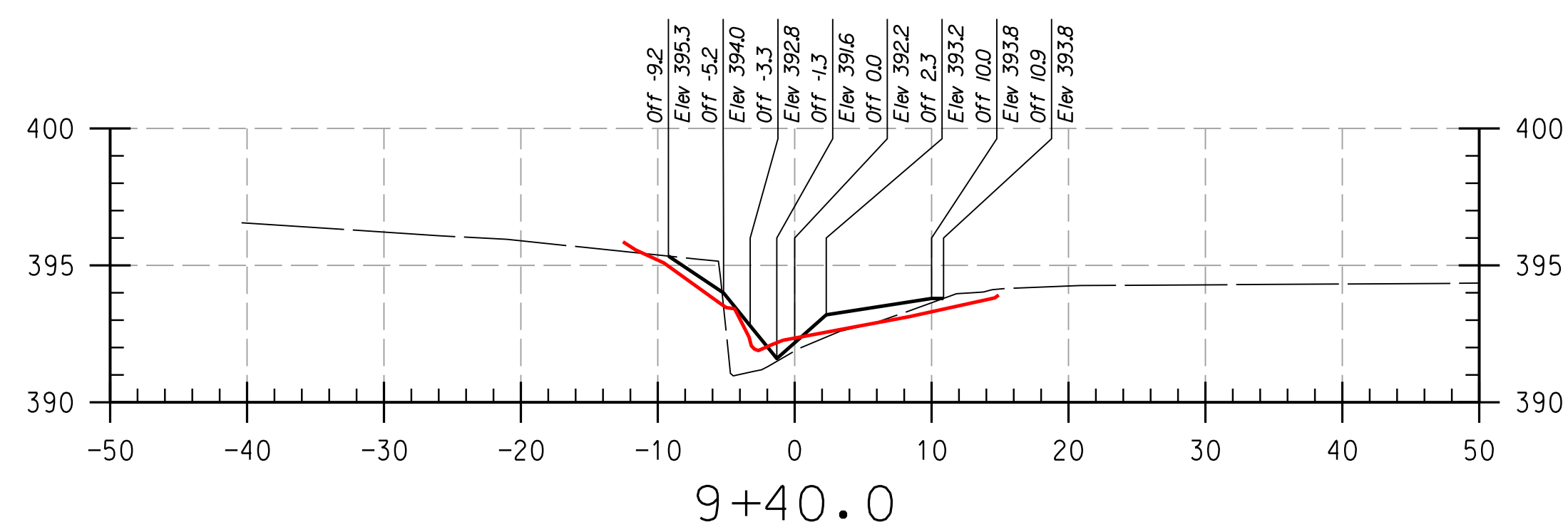
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STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 47, 81 TAX MAP 35.36
ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

**AS-BUILT
CROSS
SECTIONS**

SCALE:	HOR: 1" = 10'
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DATE:	APRIL 2017
KCI JOB NO.:	17133314.83
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PERMIT ISSUE:	
CONSTRUCTION ISSUE:	



REACH 2

LEGEND

EXISTING GRADE	
PROPOSED GRADE	
AS-BUILT GRADE	

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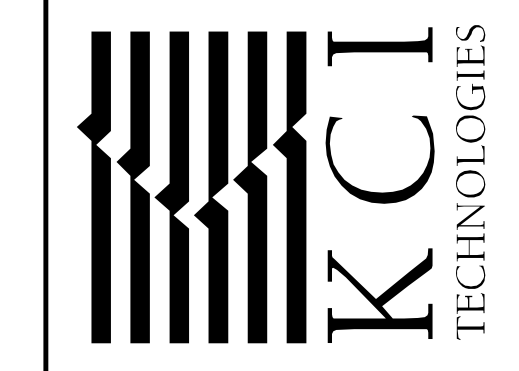
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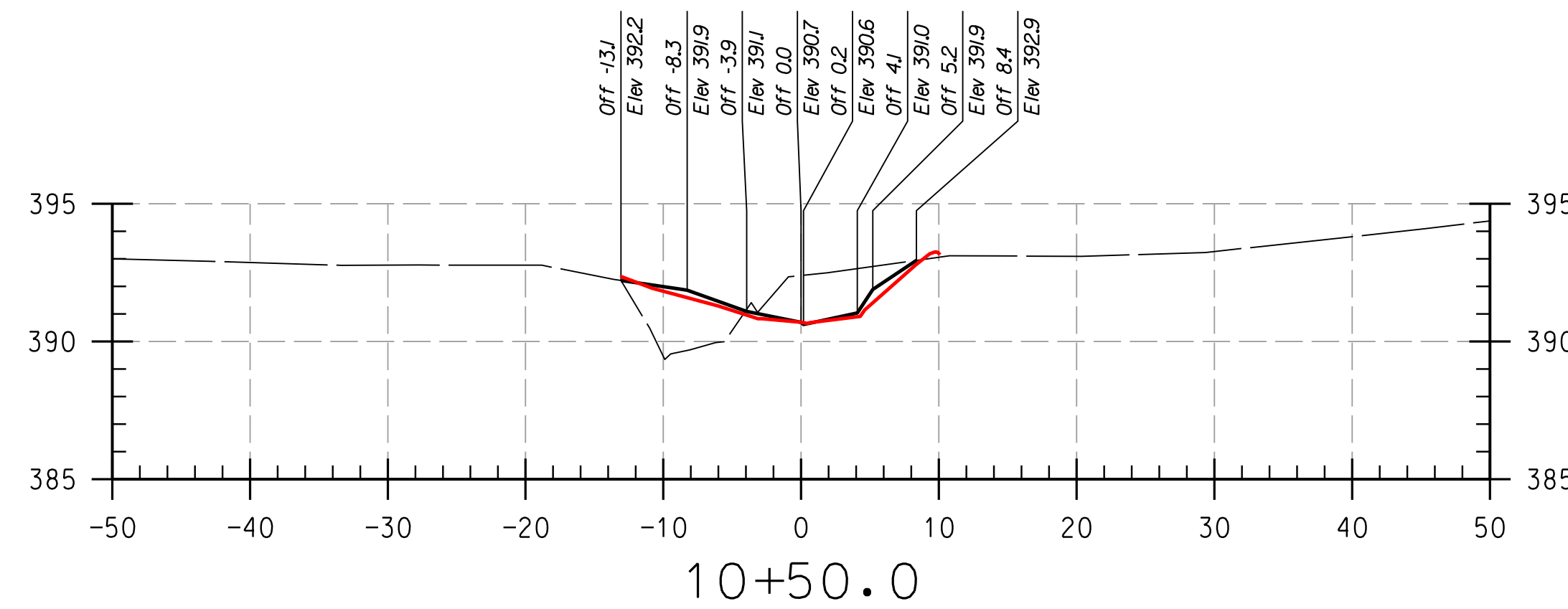
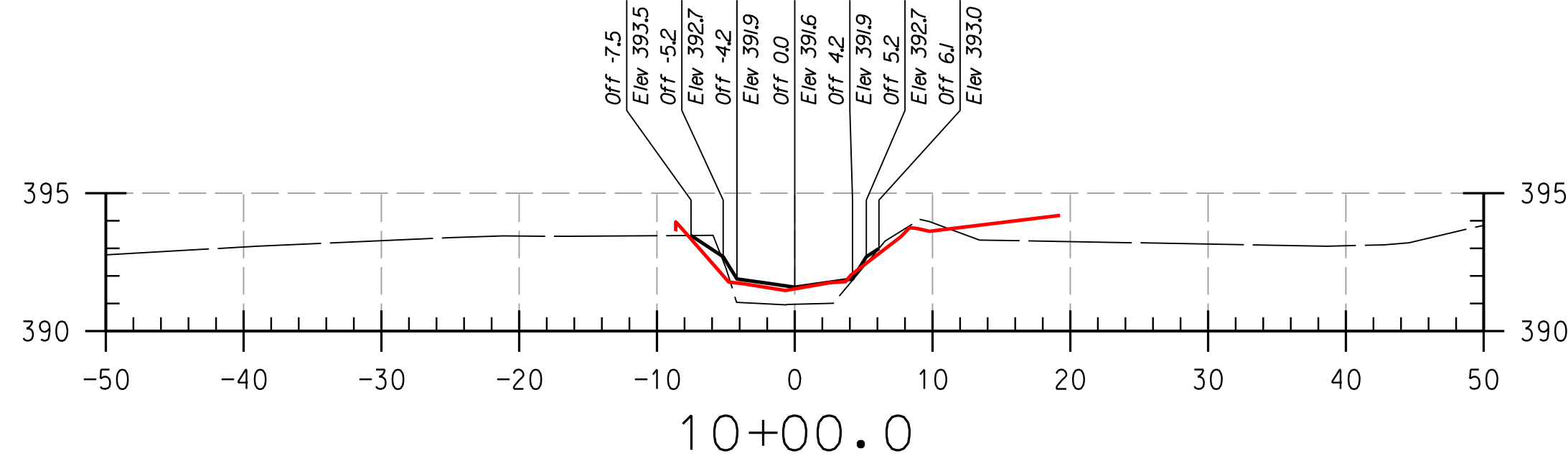
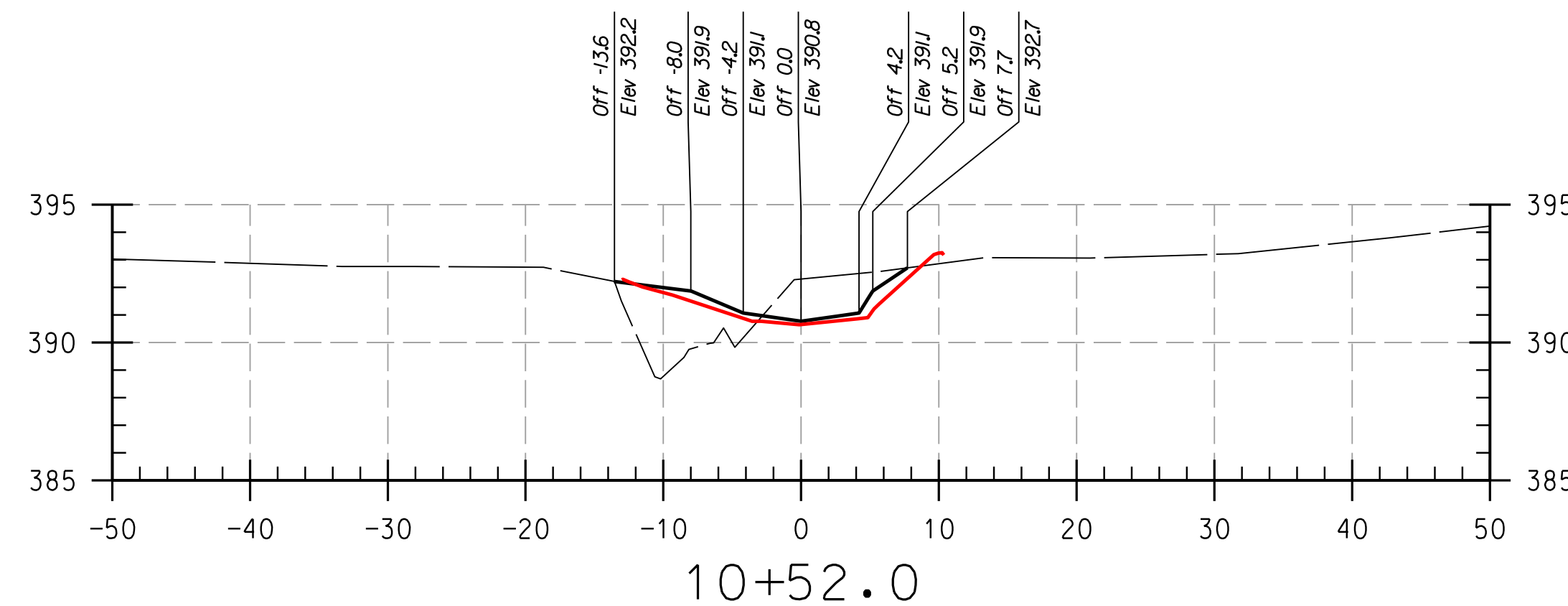
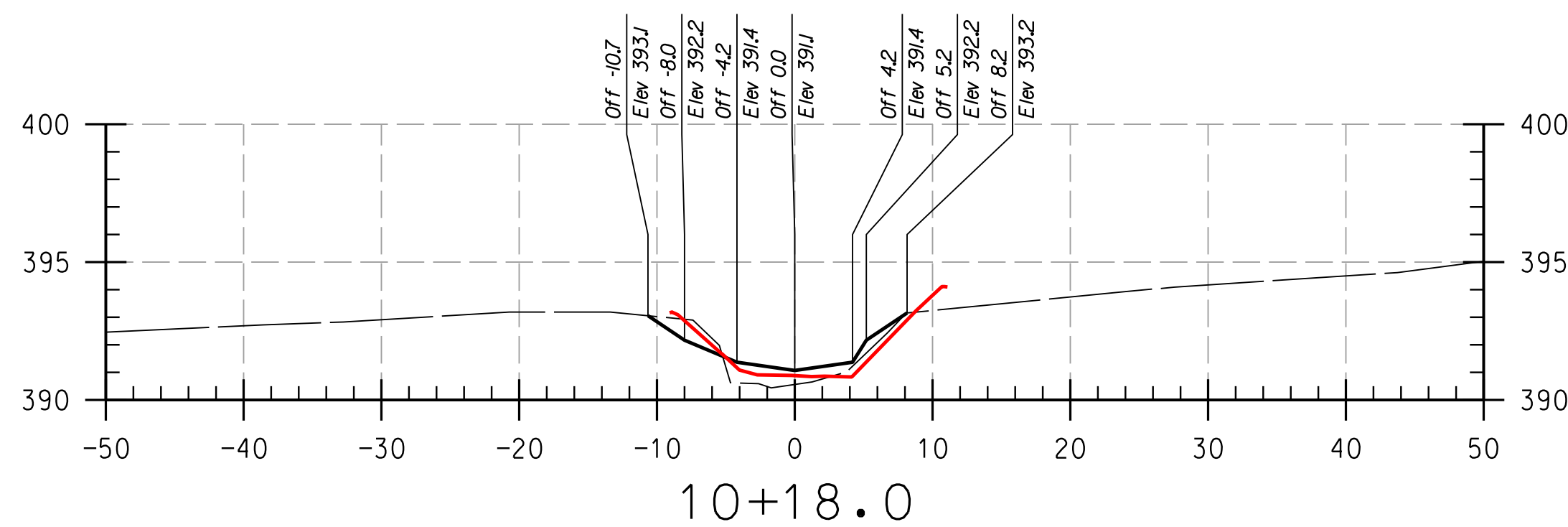
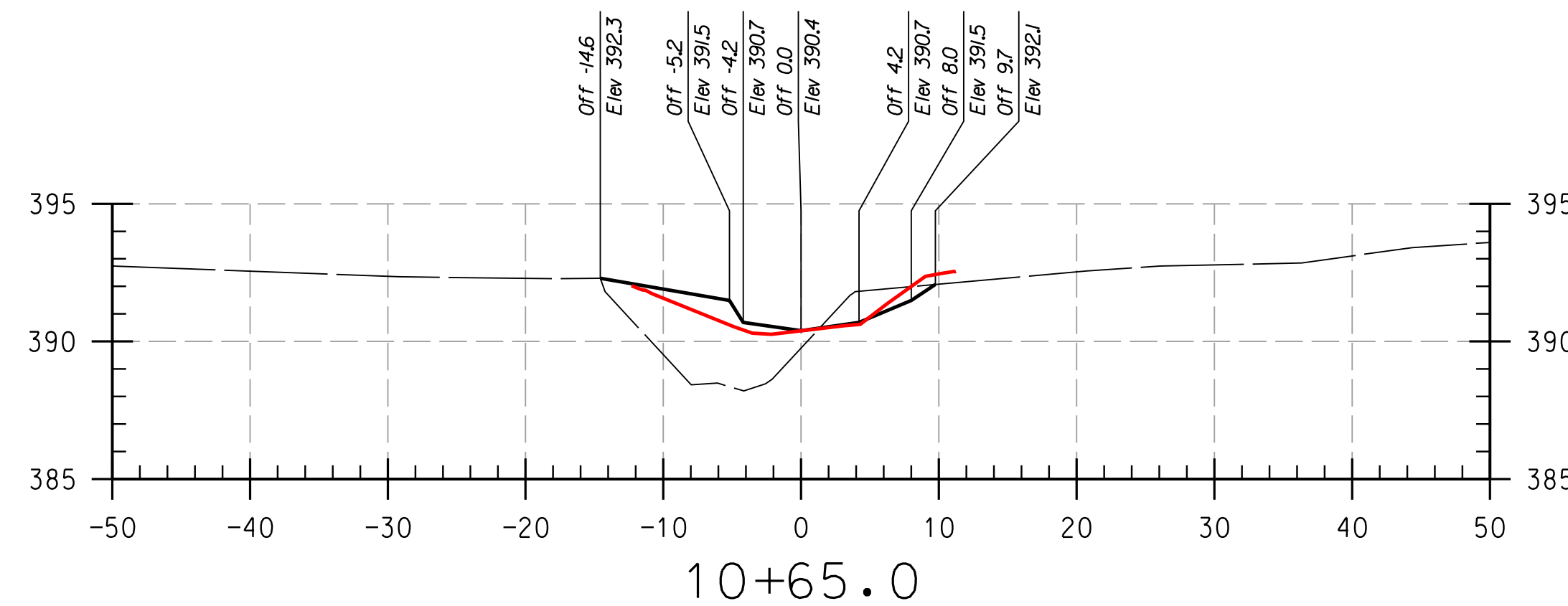
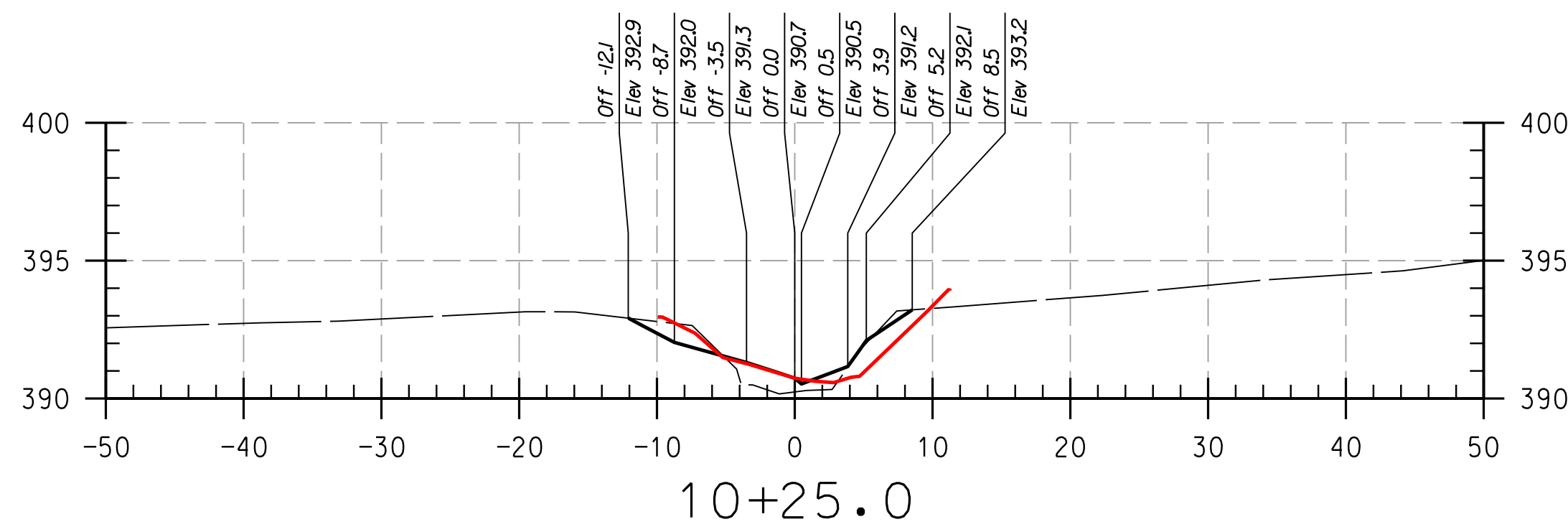
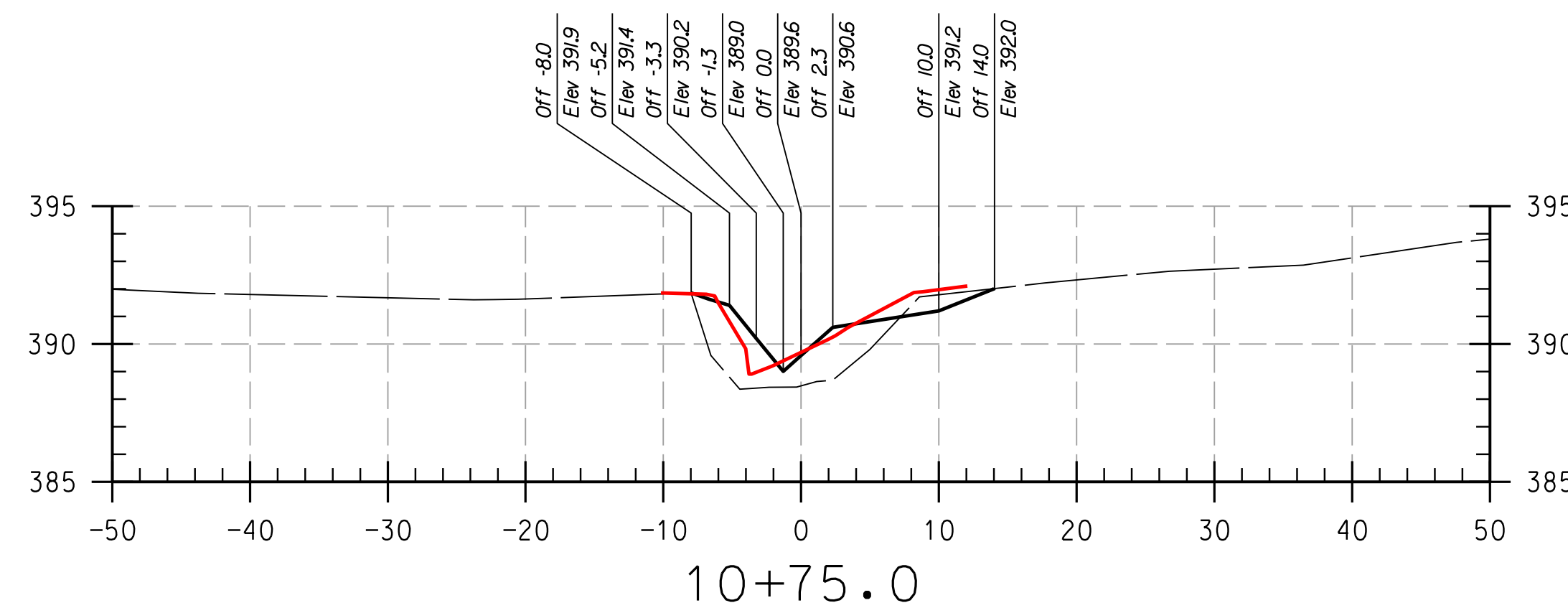
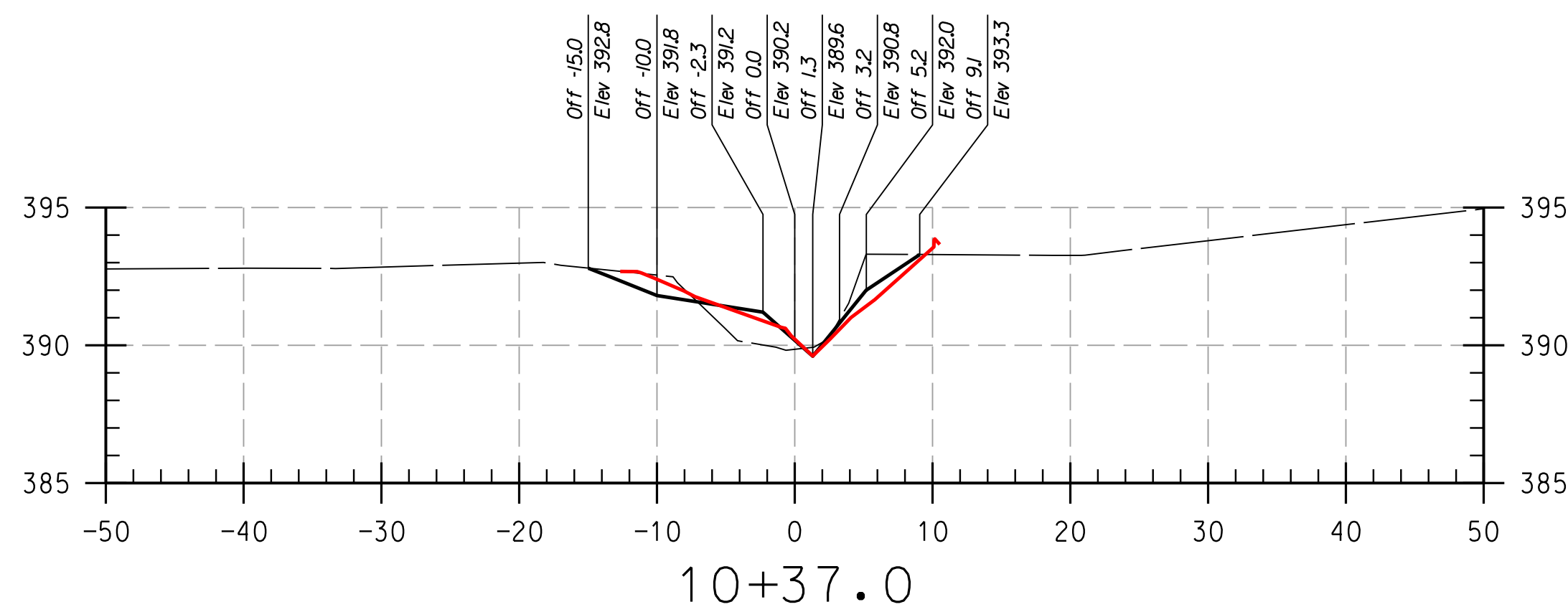
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**HOWARD COMMUNITY COLLEGE
STREAM RESTORATION PROJECT**
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 47, 81 TAX MAP 35.36
ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

AS-BUILT CROSS SECTIONS

SCALE:	HOR: 1" = 10'
	VERT: 1" = 5'
DATE:	APRIL 2017
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	



REACH 2

LEGEND

EXISTING GRADE	---
PROPOSED GRADE	—
AS-BUILT GRADE	—

NOTE:
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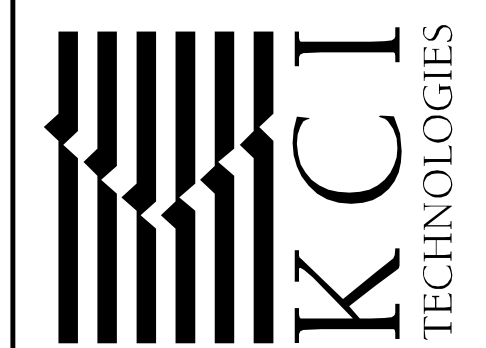
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**AS-BUILT
 CROSS
 SECTIONS**

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DATE: APRIL 2017

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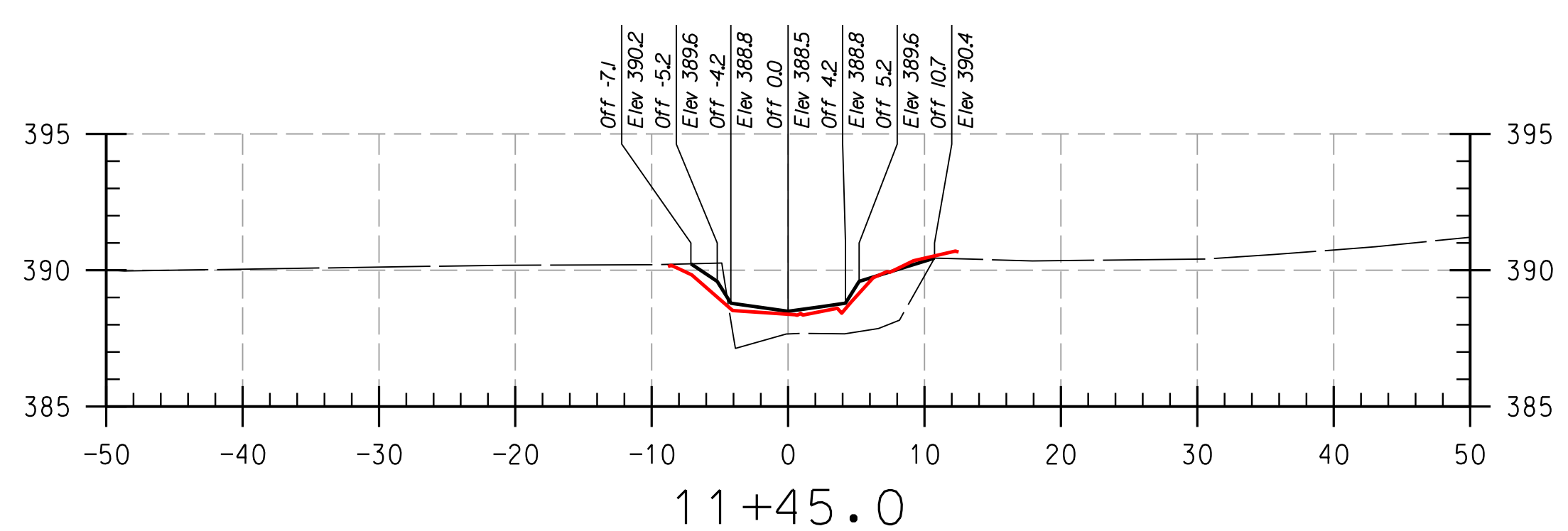
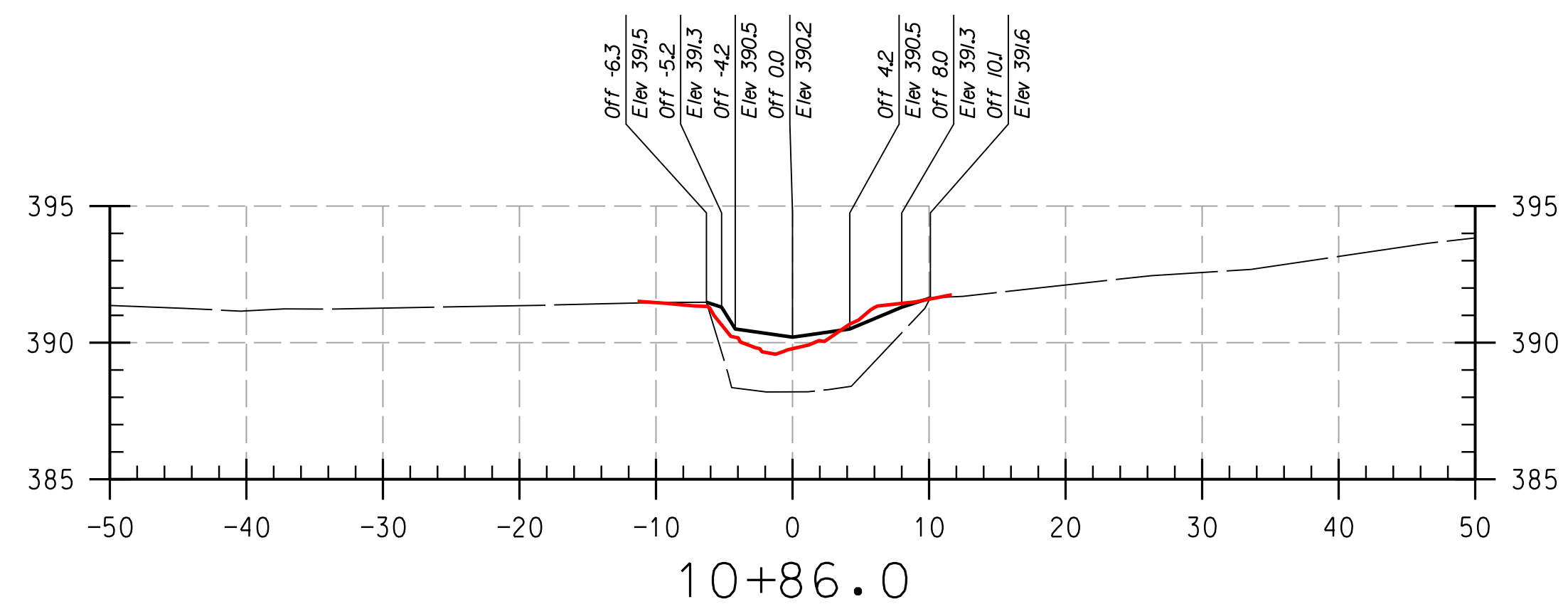
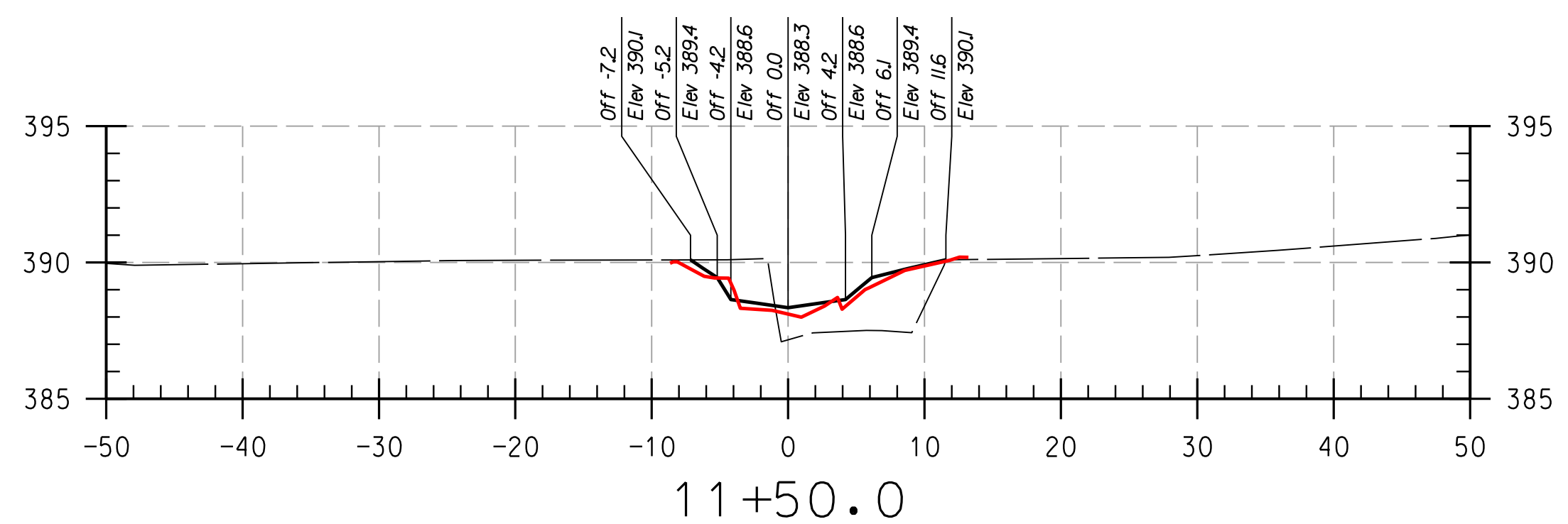
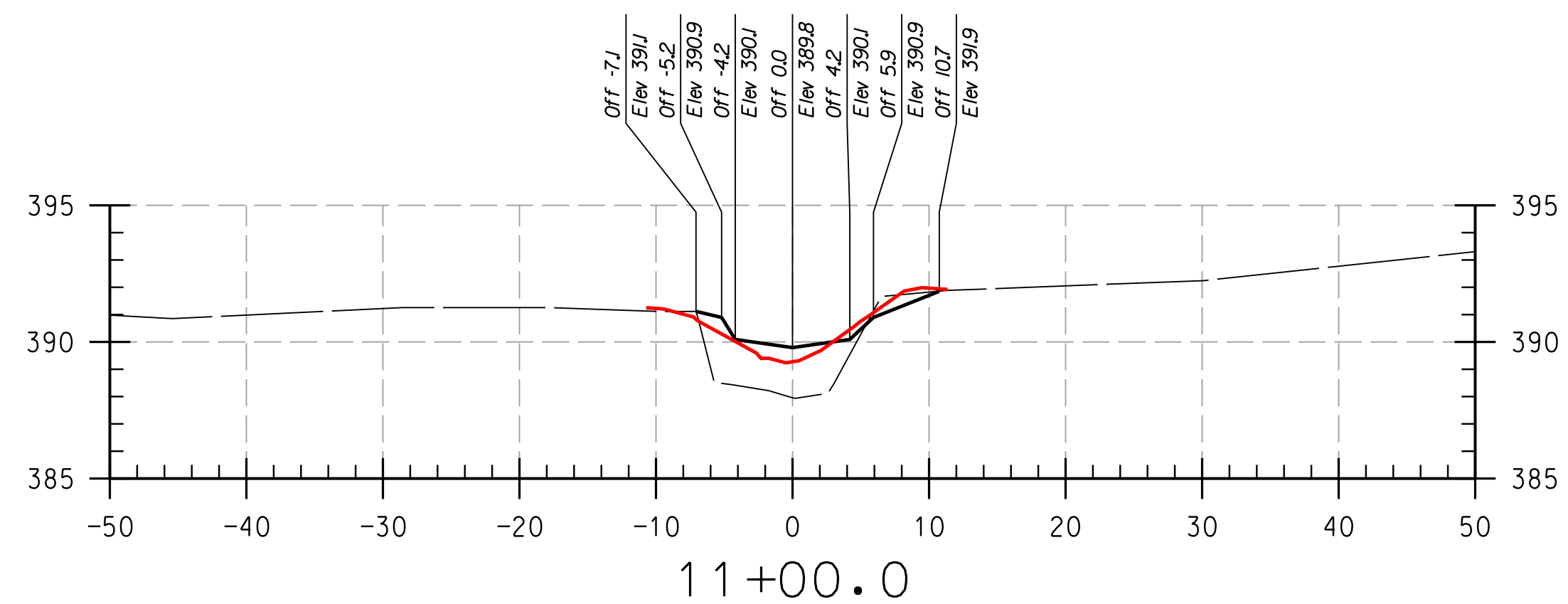
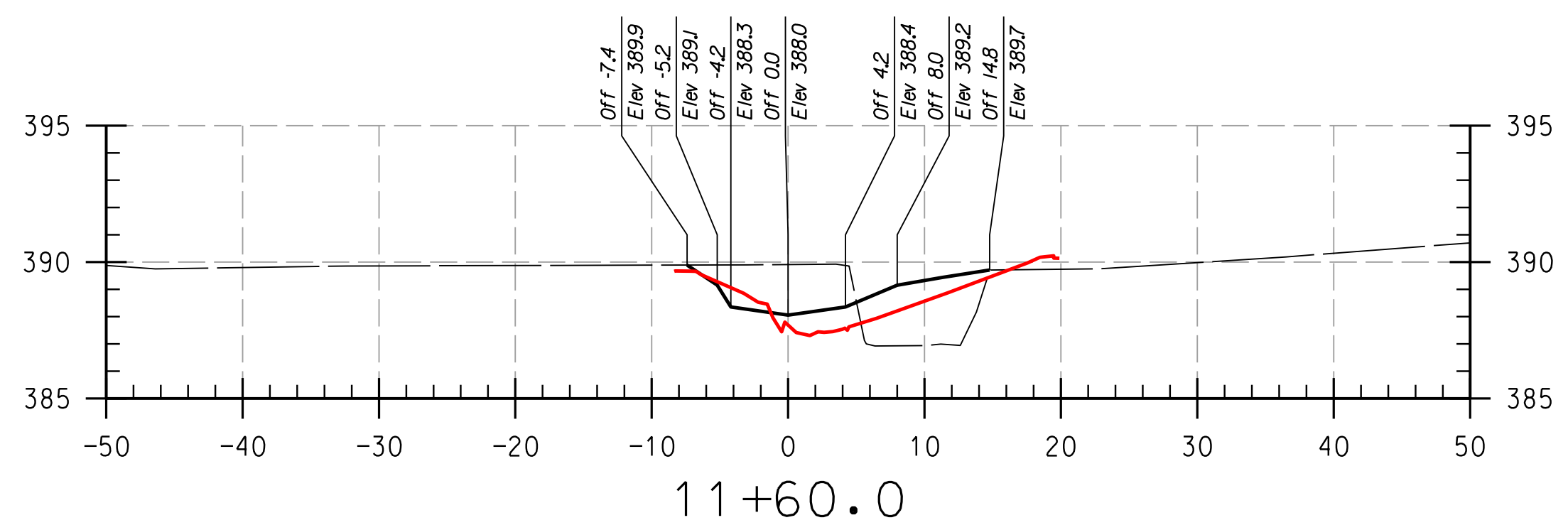
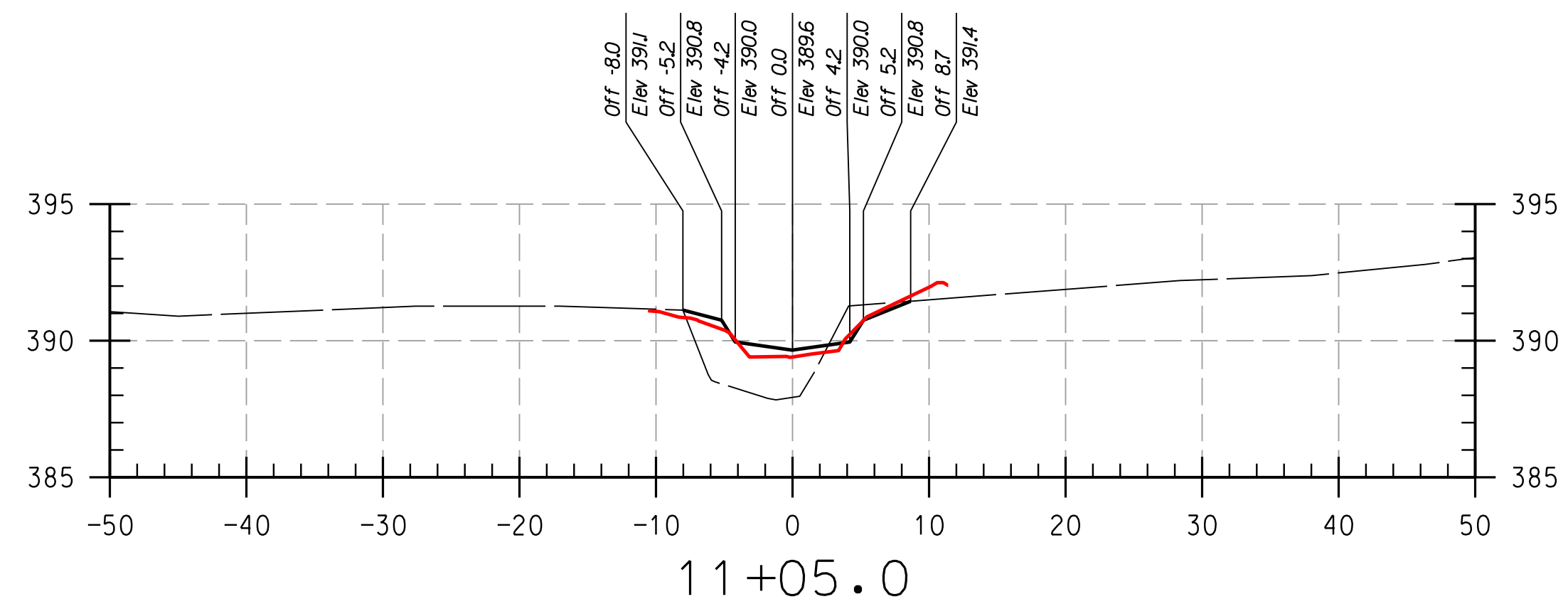
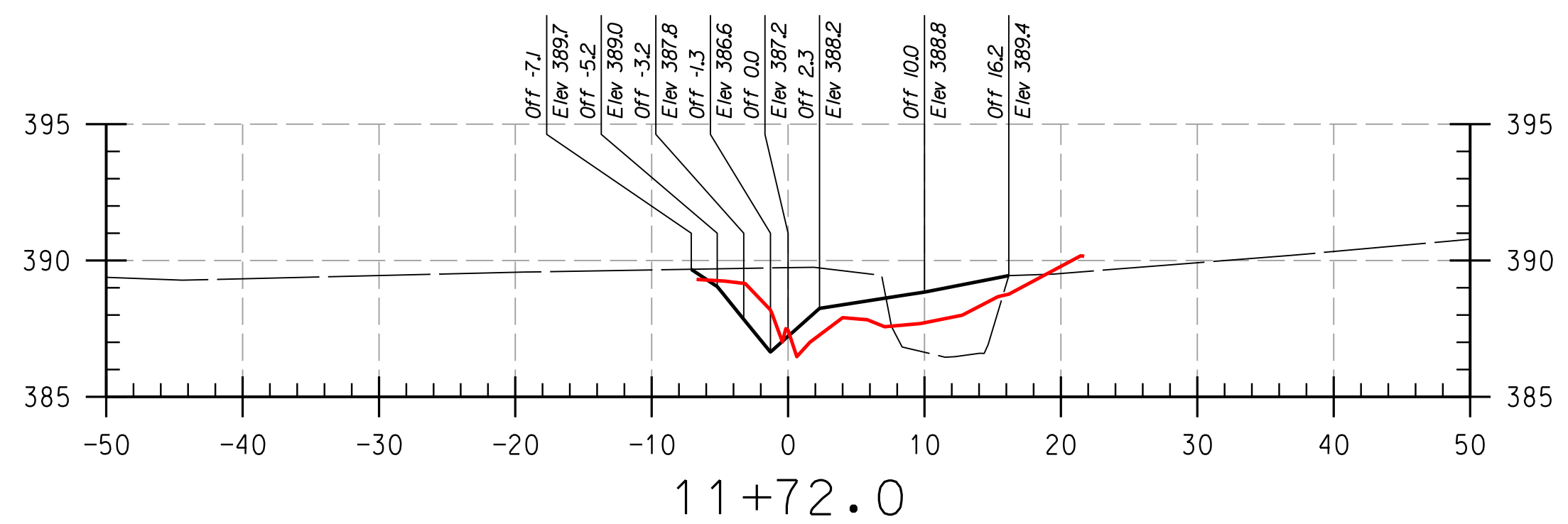
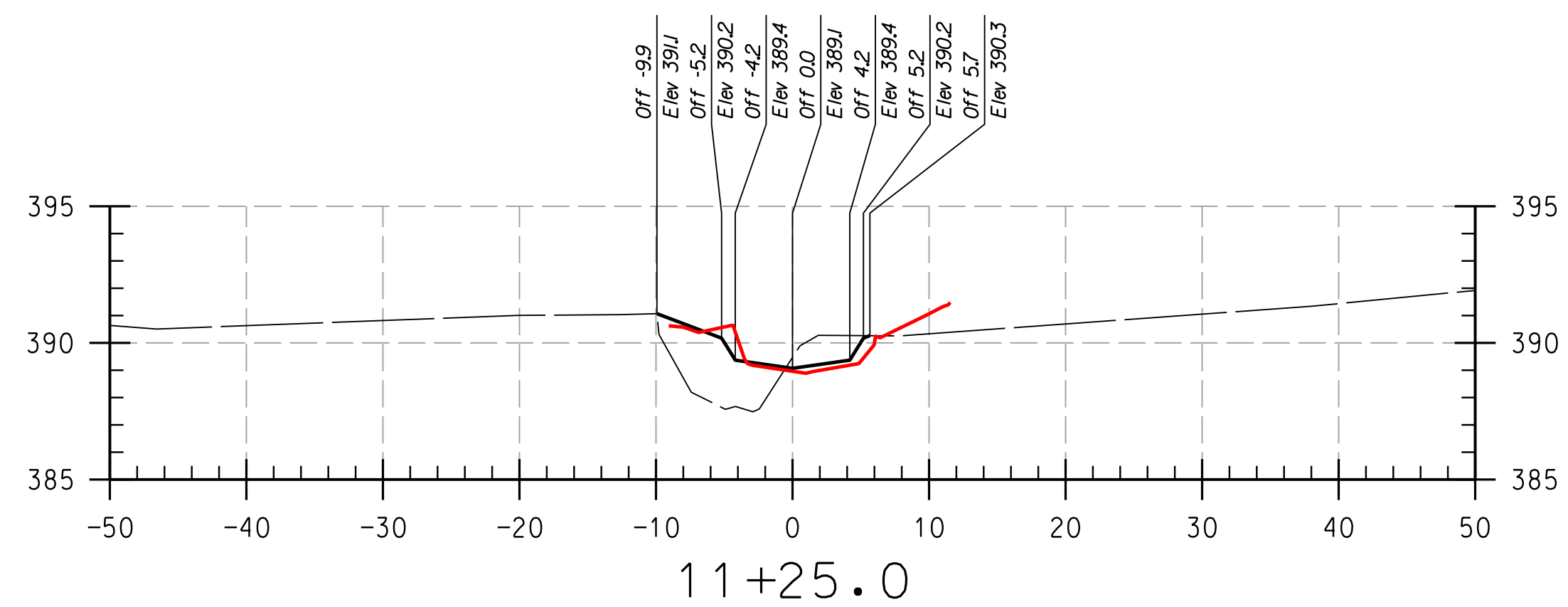
CAPITAL PROJECT NO.: D-1158

PERMIT ISSUE:

CONSTRUCTION ISSUE:

CS-12

SHEET NO.: 12 OF 27



REACH 2

LEGEND

EXISTING GRADE	---
PROPOSED GRADE	---
AS-BUILT GRADE	---

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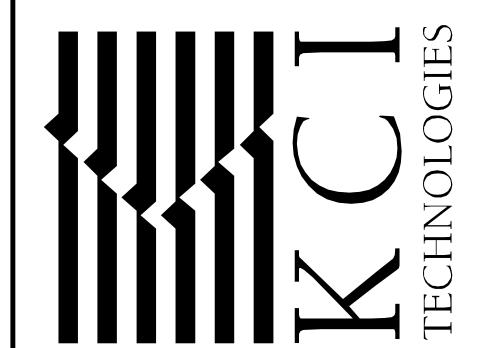
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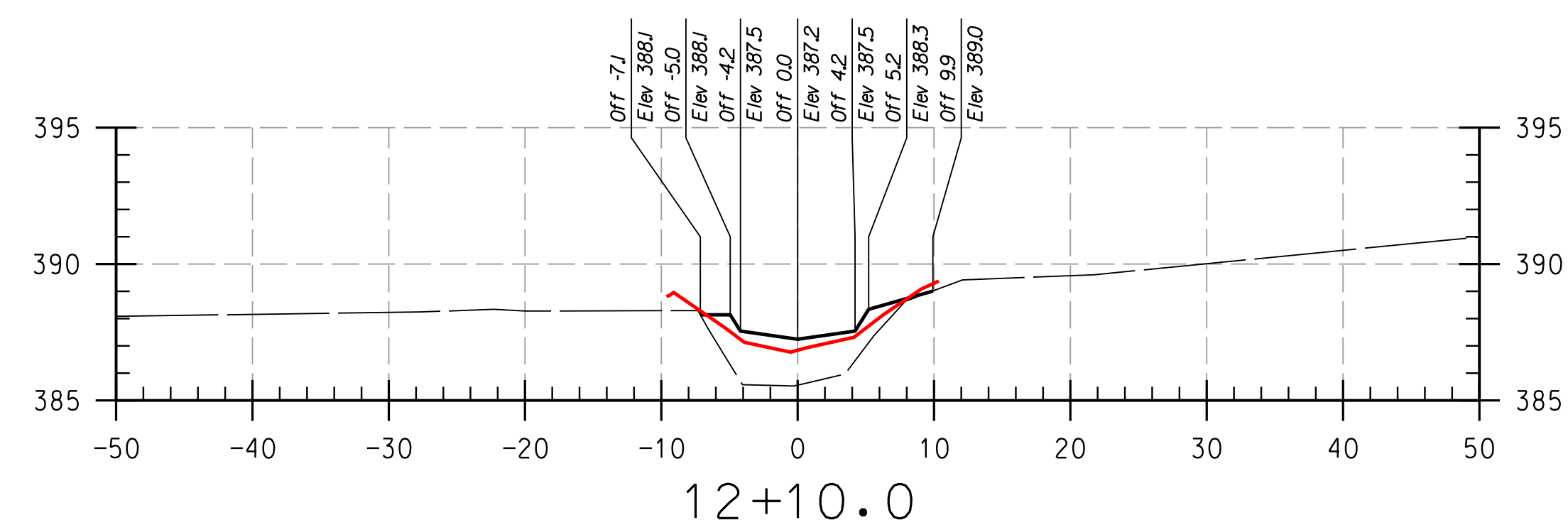
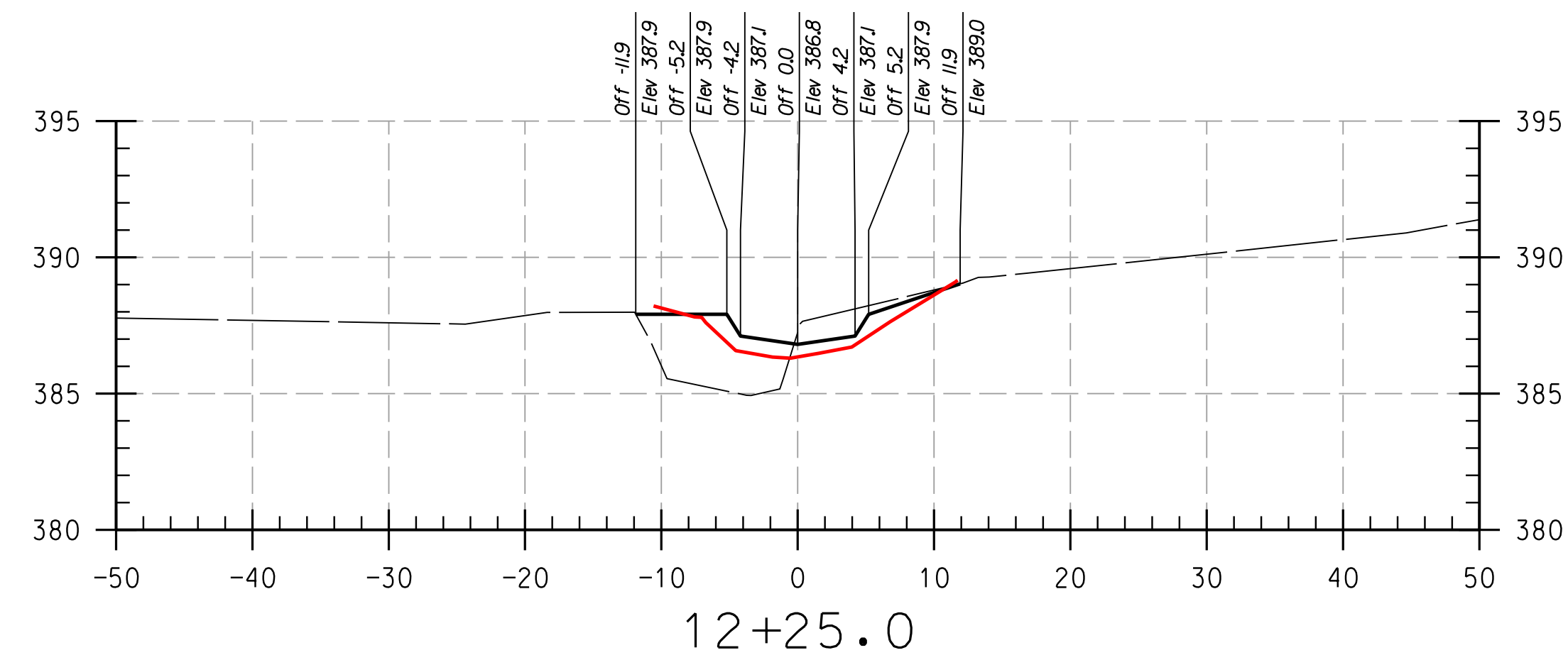
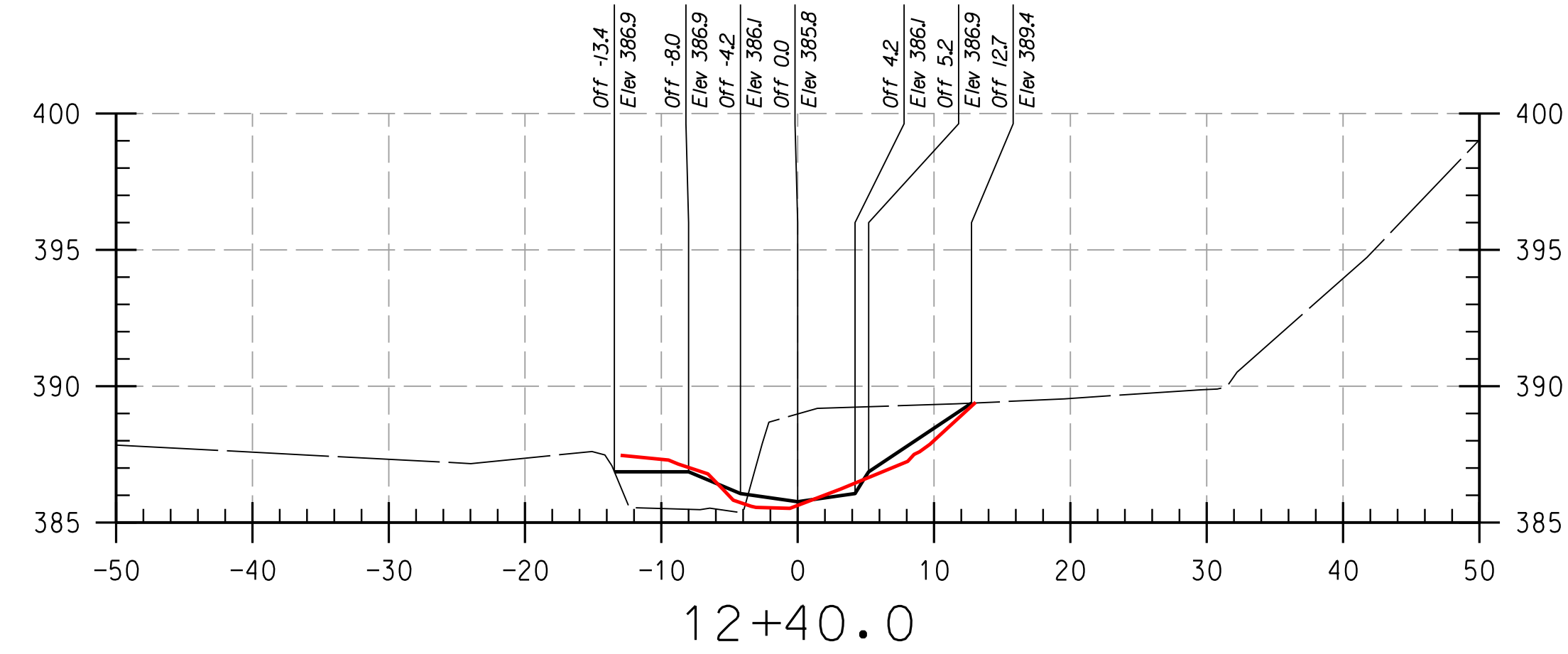
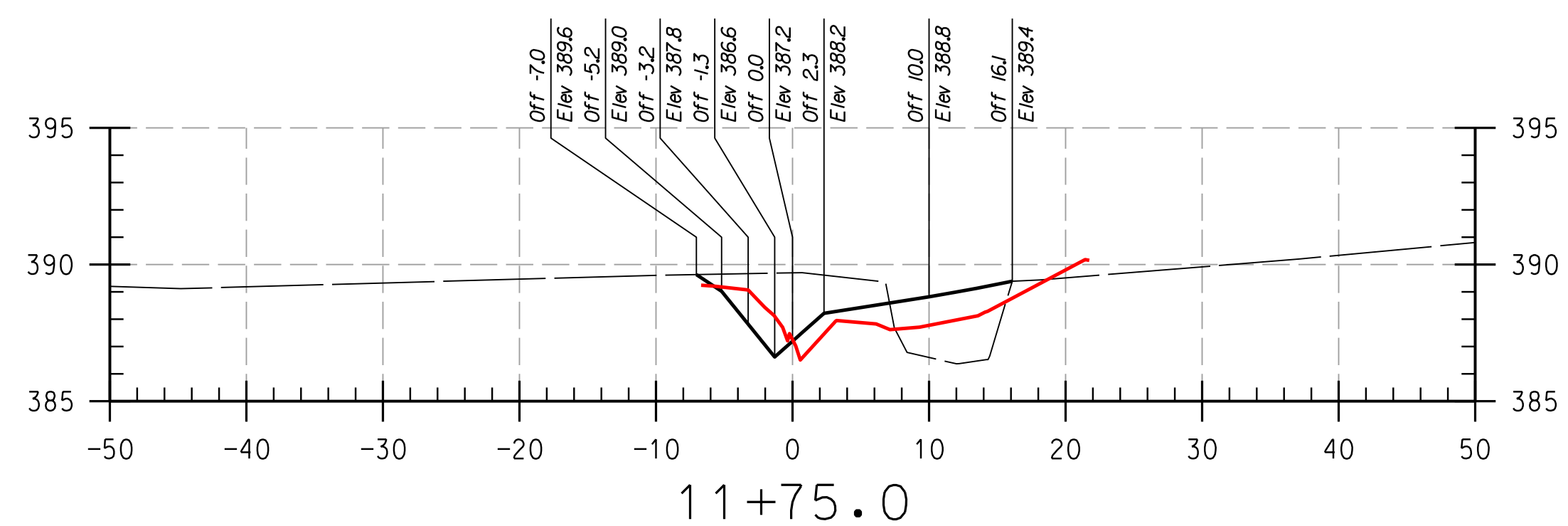
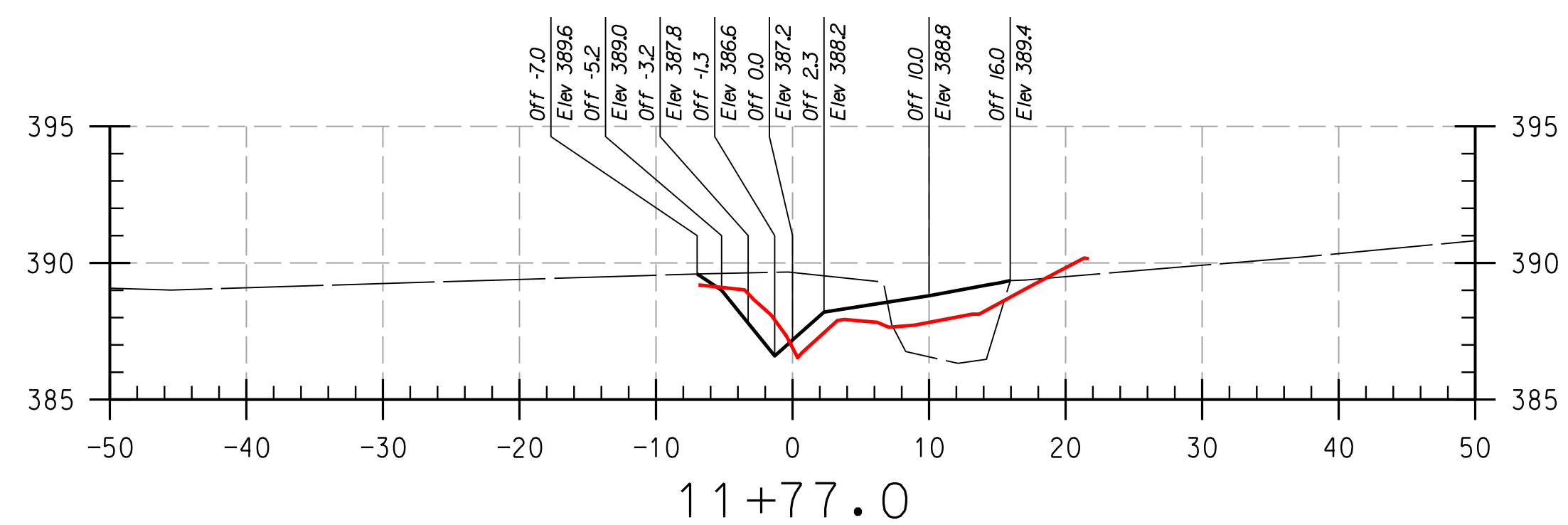
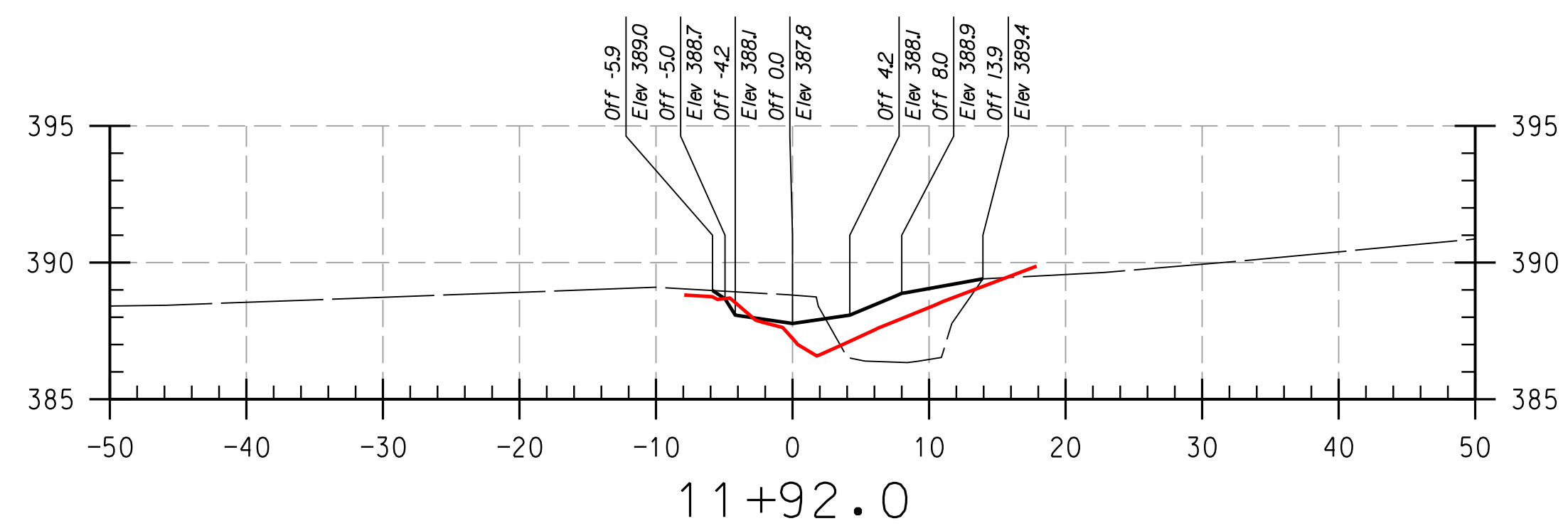
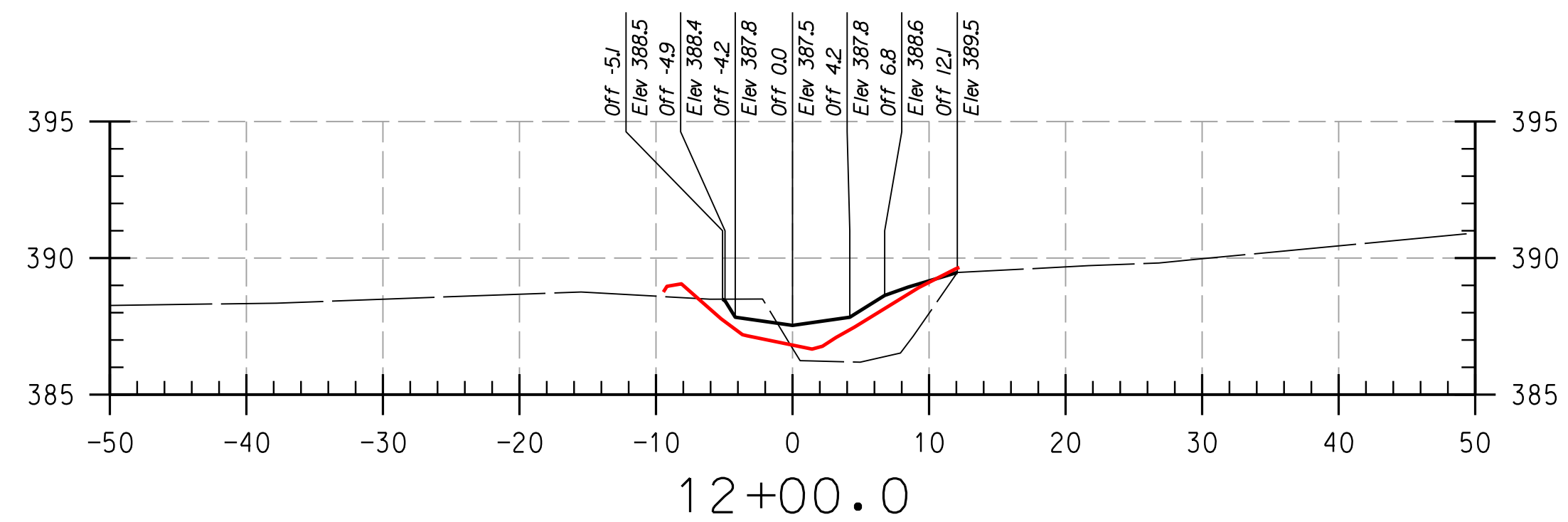
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AS-BUILT CROSS SECTIONS

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REACH 2

LEGEND

EXISTING GRADE	—
PROPOSED GRADE	—
AS-BUILT GRADE	—

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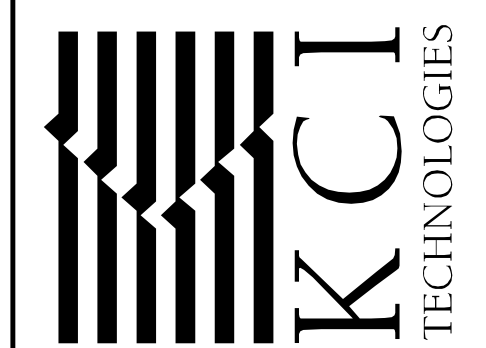
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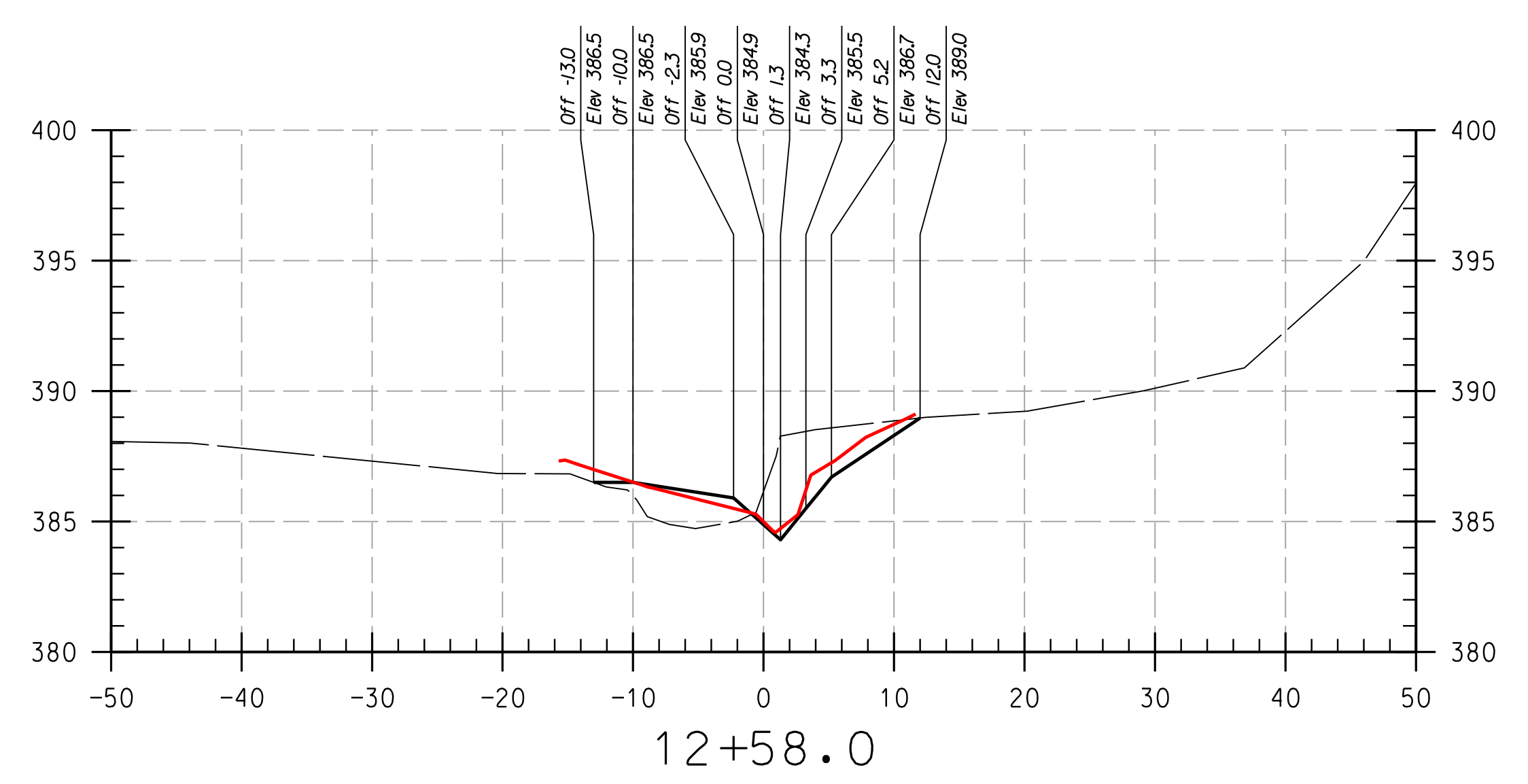
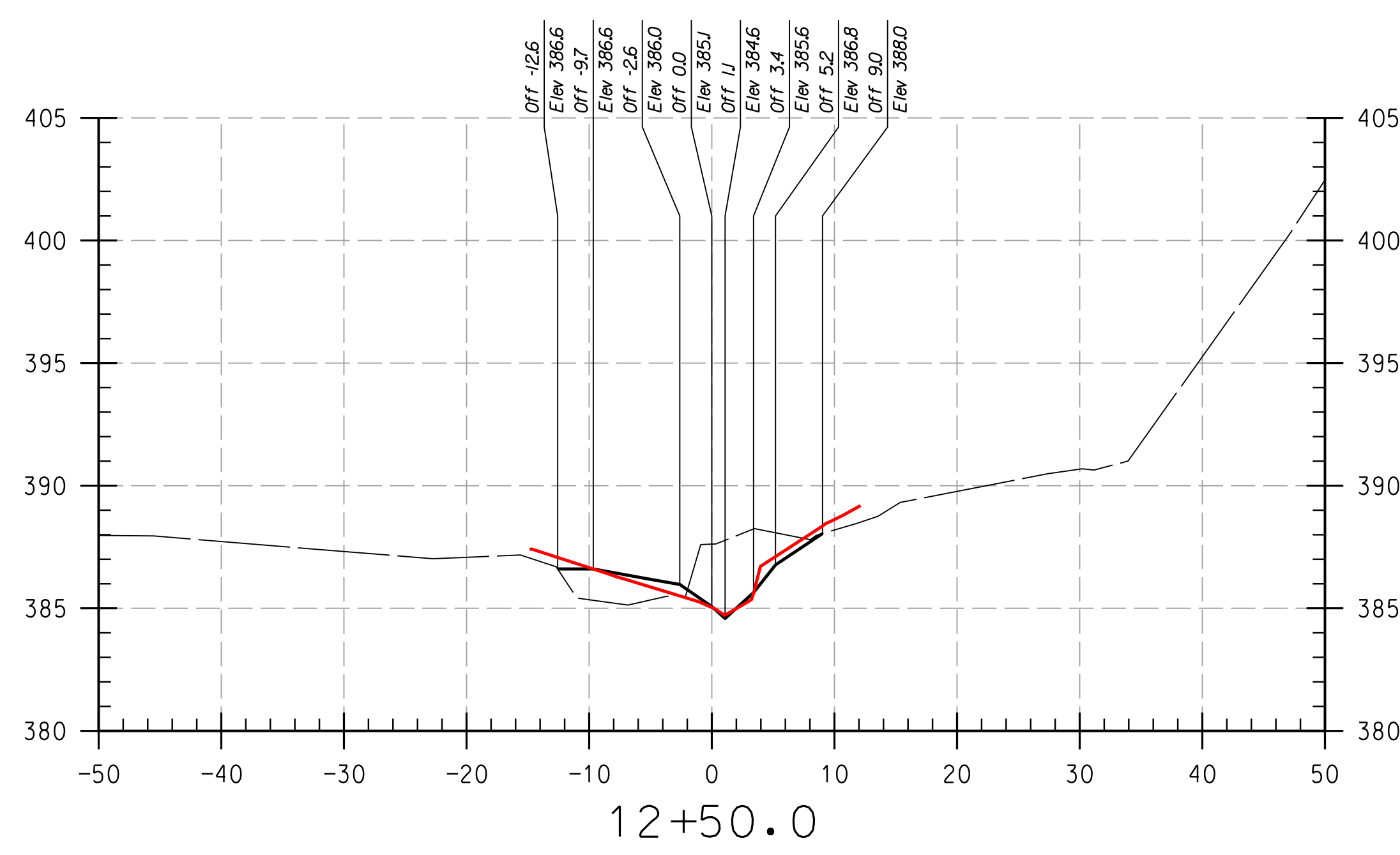
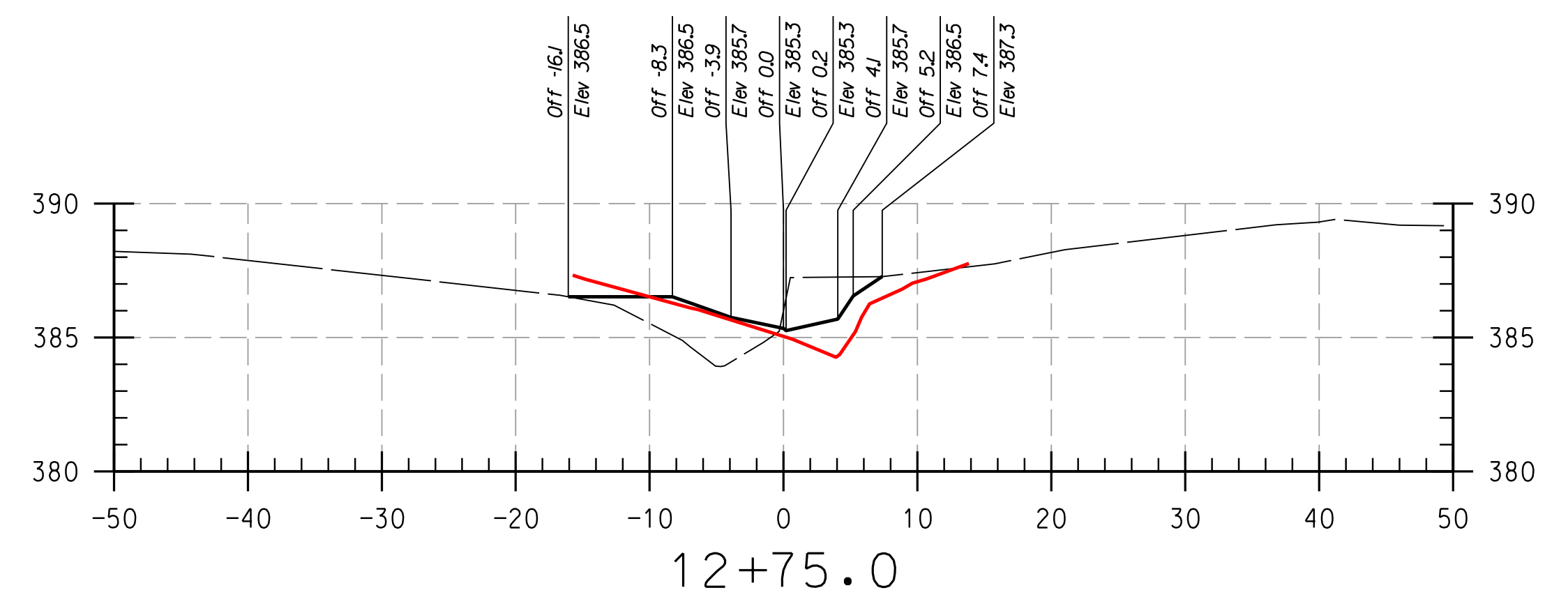
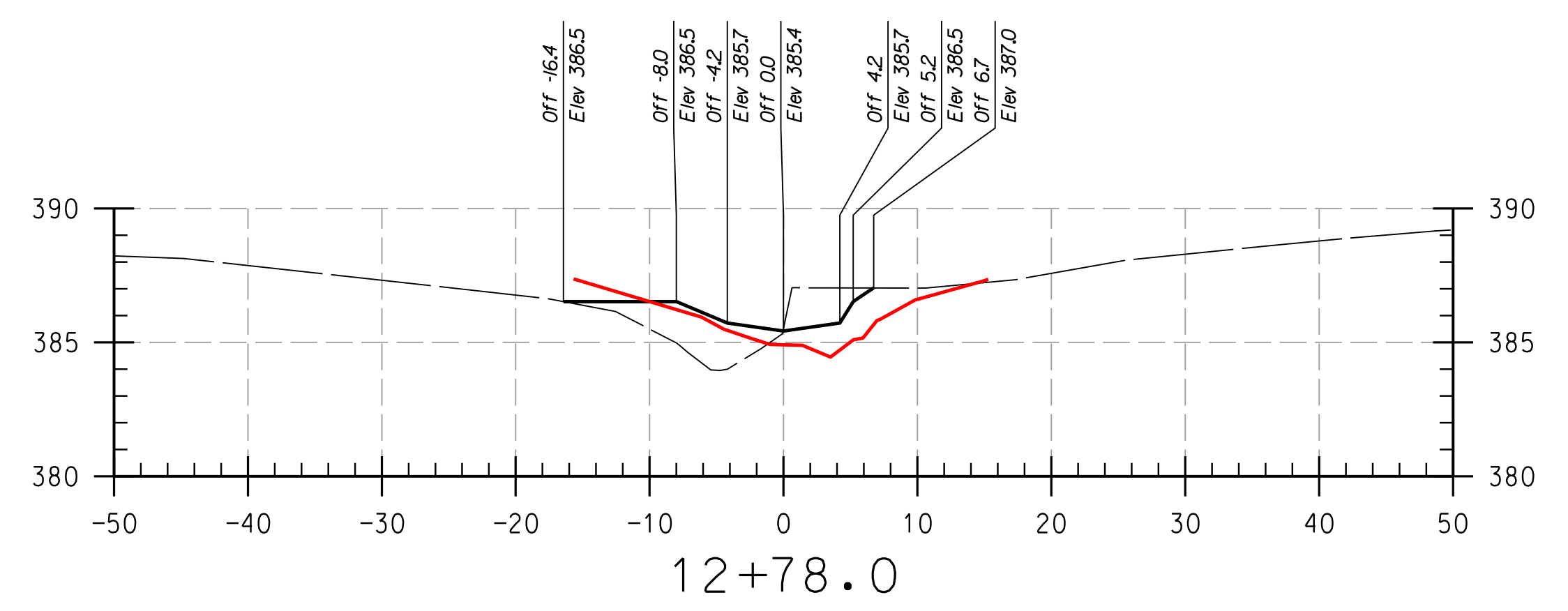
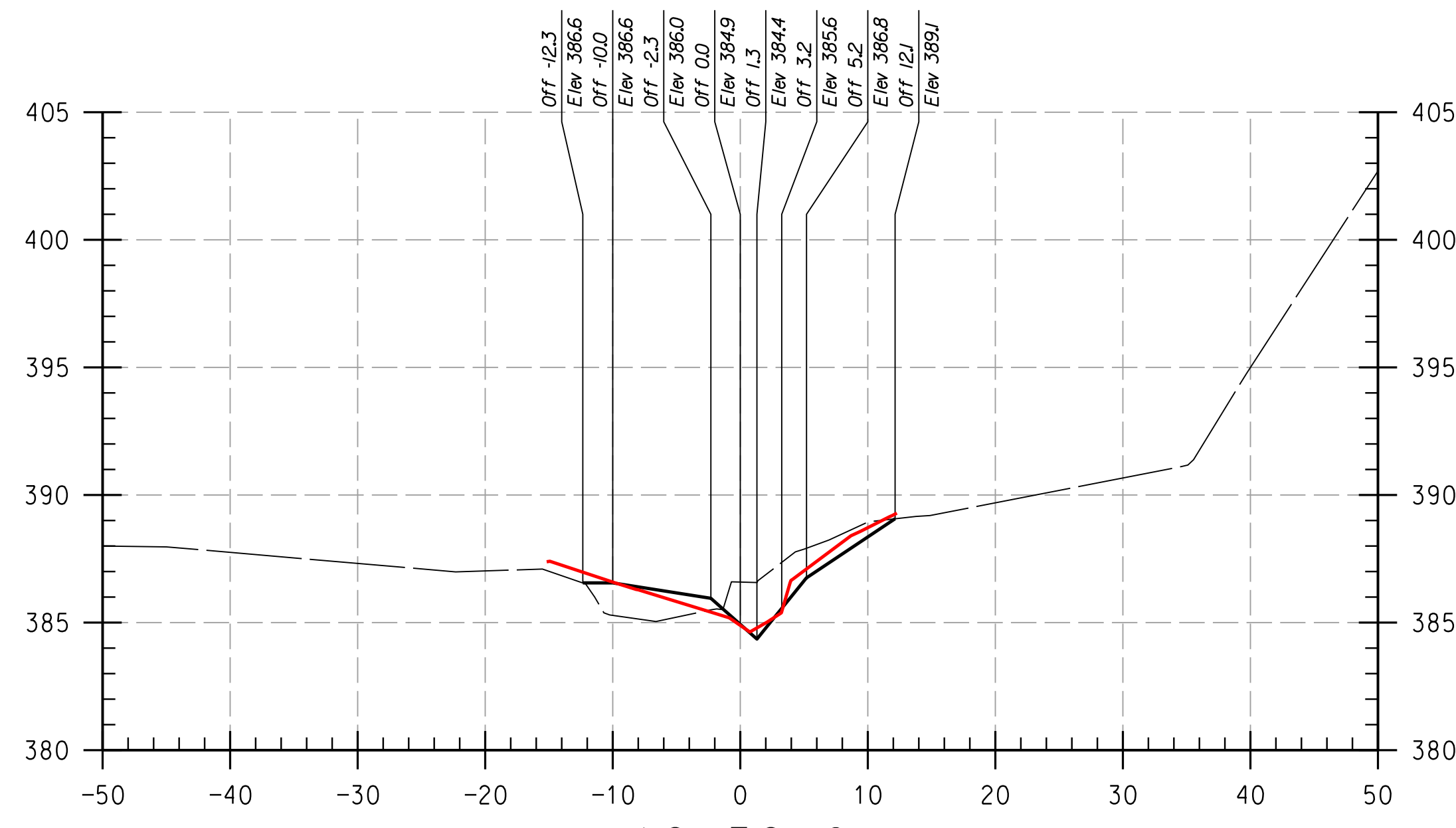
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STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 47.81 TAX MAP 35.36
ZONING POR.NT ELECTION DISTRICT 05 GRIDBLOCK 0006

AS-BUILT CROSS SECTIONS

SCALE:	HOR: 1" = 10'
	VERT: 1" = 5'
DATE:	APRIL 2017
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	



REACH 2

LEGEND

EXISTING GRADE ————

PROPOSED GRADE ————

AS-BUILT GRADE ————

NOTE:
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HOWARD SCD _____ DATE _____

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES _____ DATE _____

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38311. EXPIRATION DATE: JANUARY 06, 2018

NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD
SPARKS, MARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
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HOWARD COMMUNITY COLLEGE
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
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6751 COLUMBIA GATEWAY DRIVE
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AS-BUILT CROSS SECTIONS

SCALE: HOR: 1" = 10'
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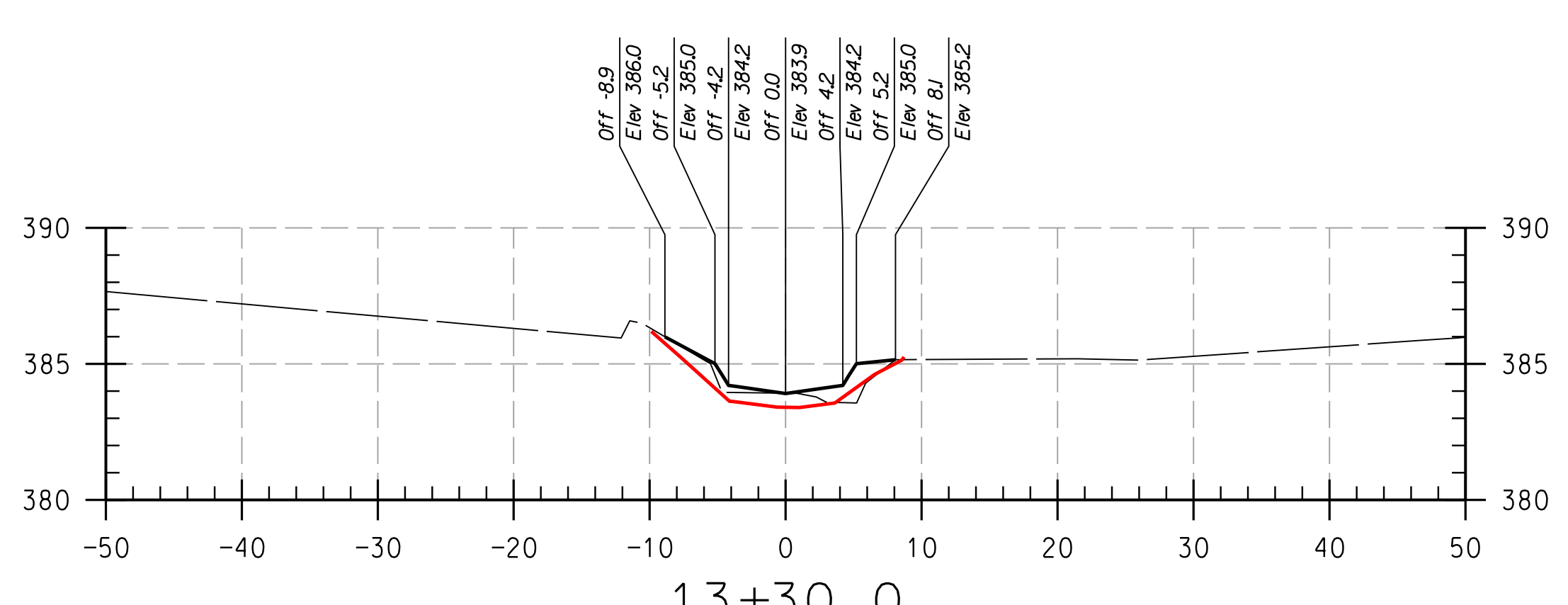
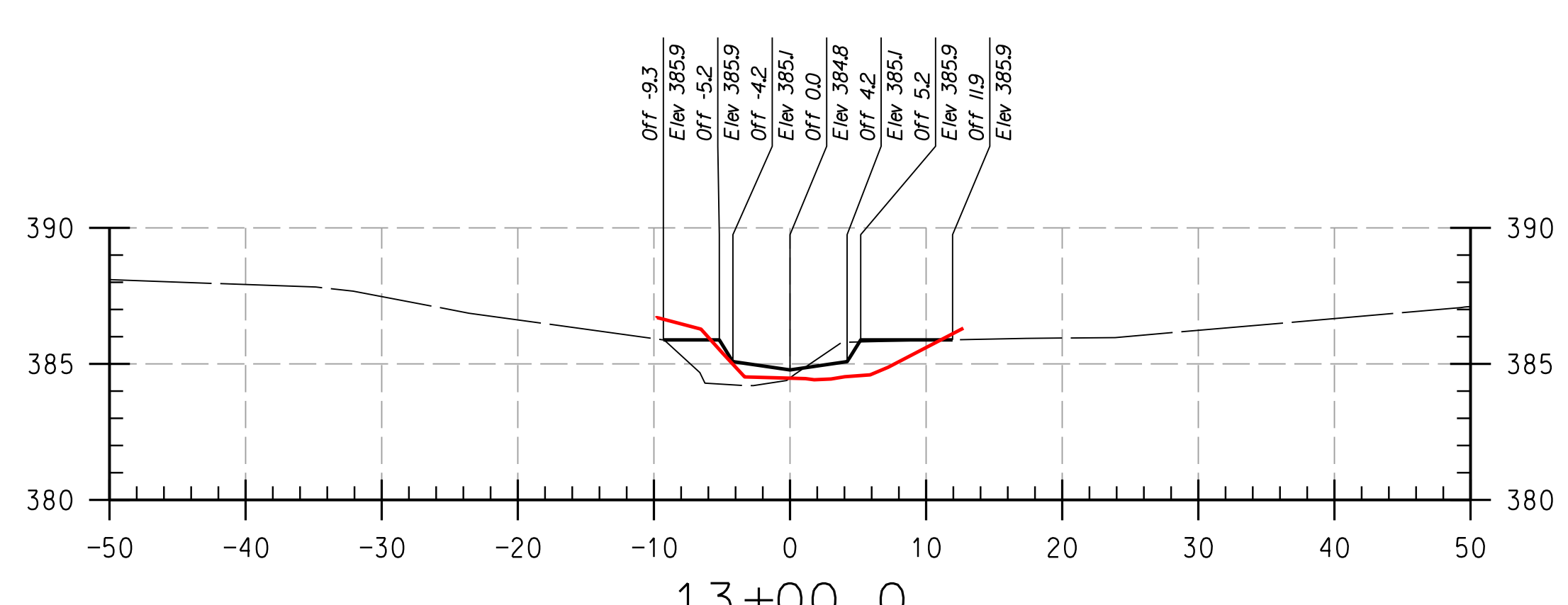
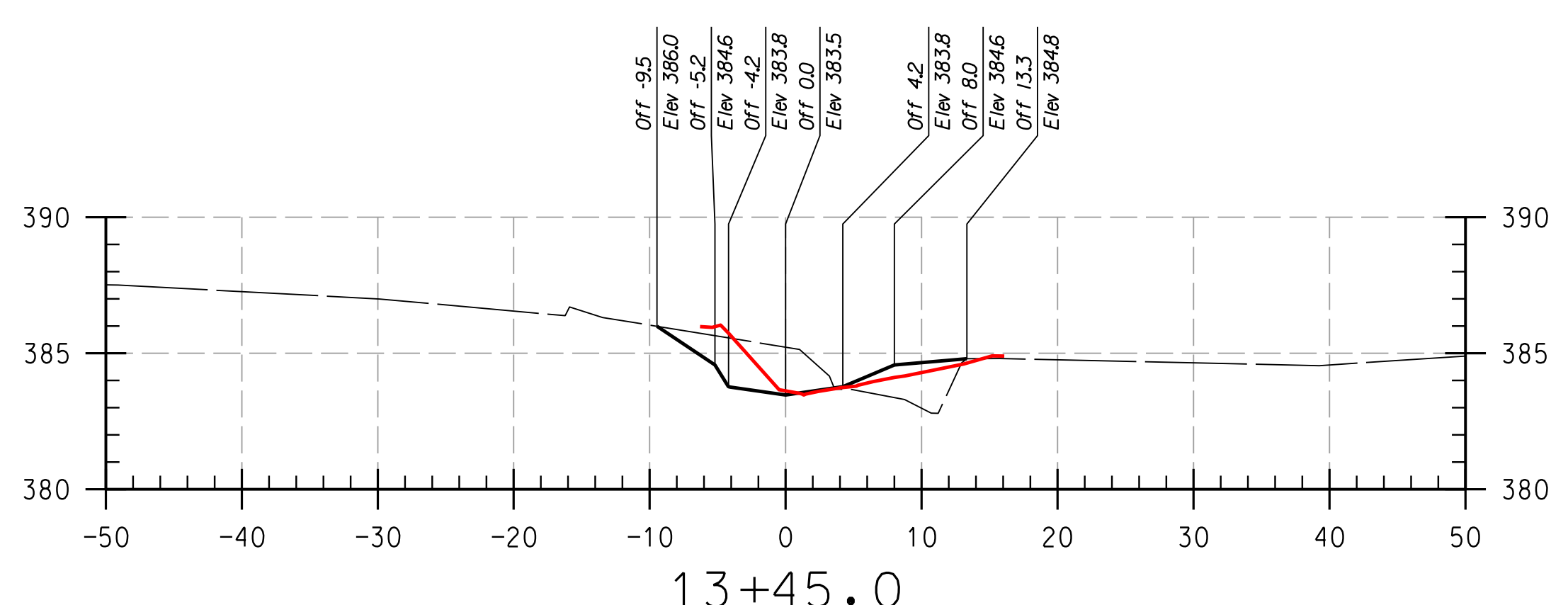
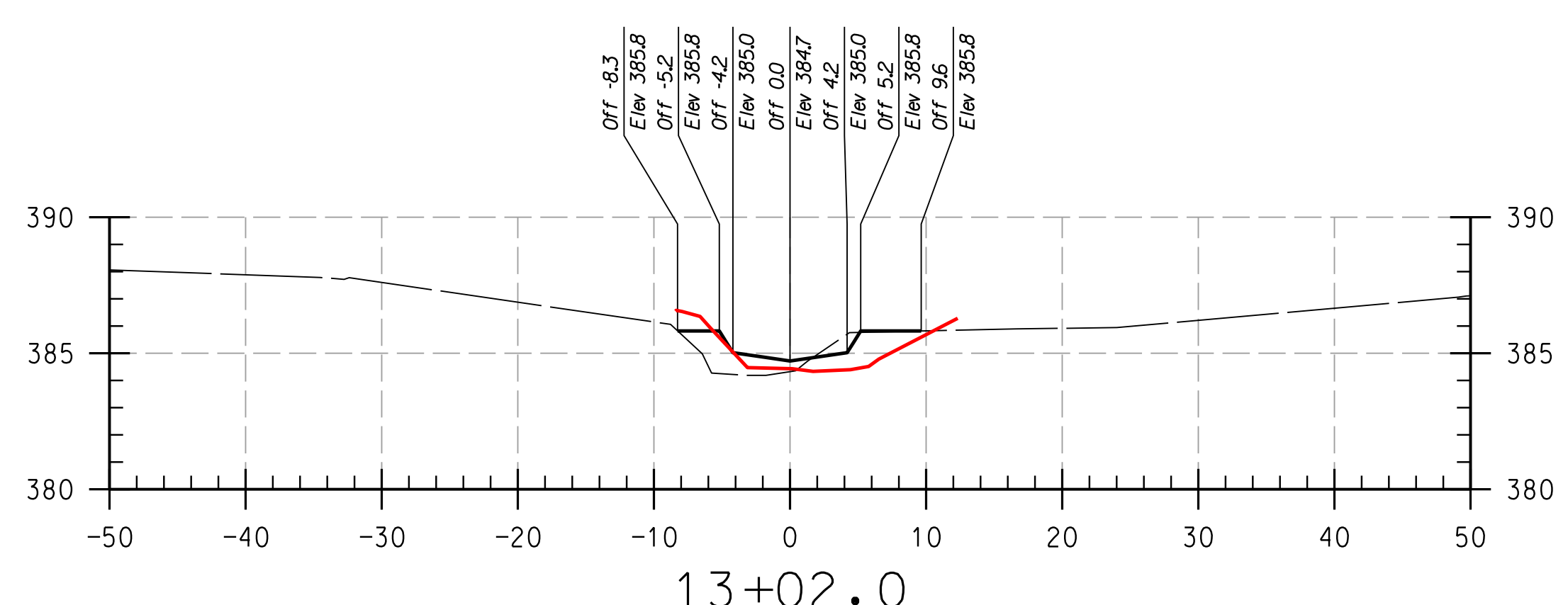
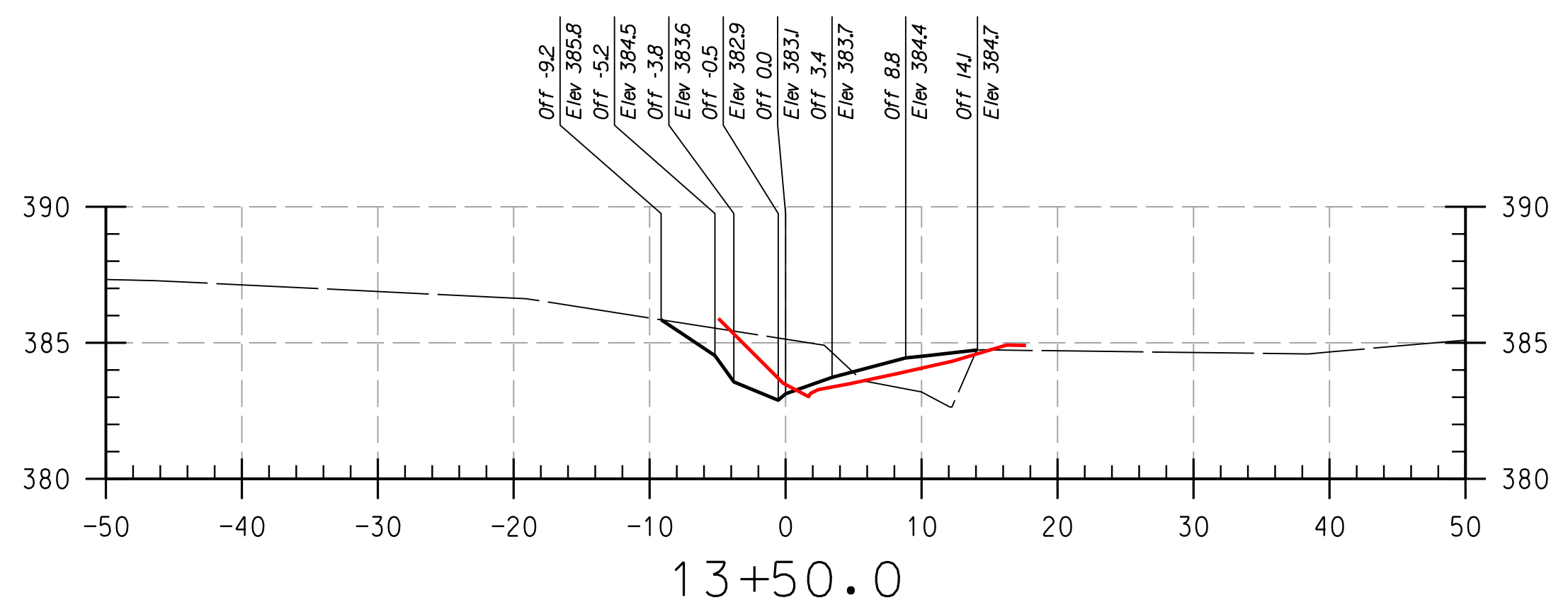
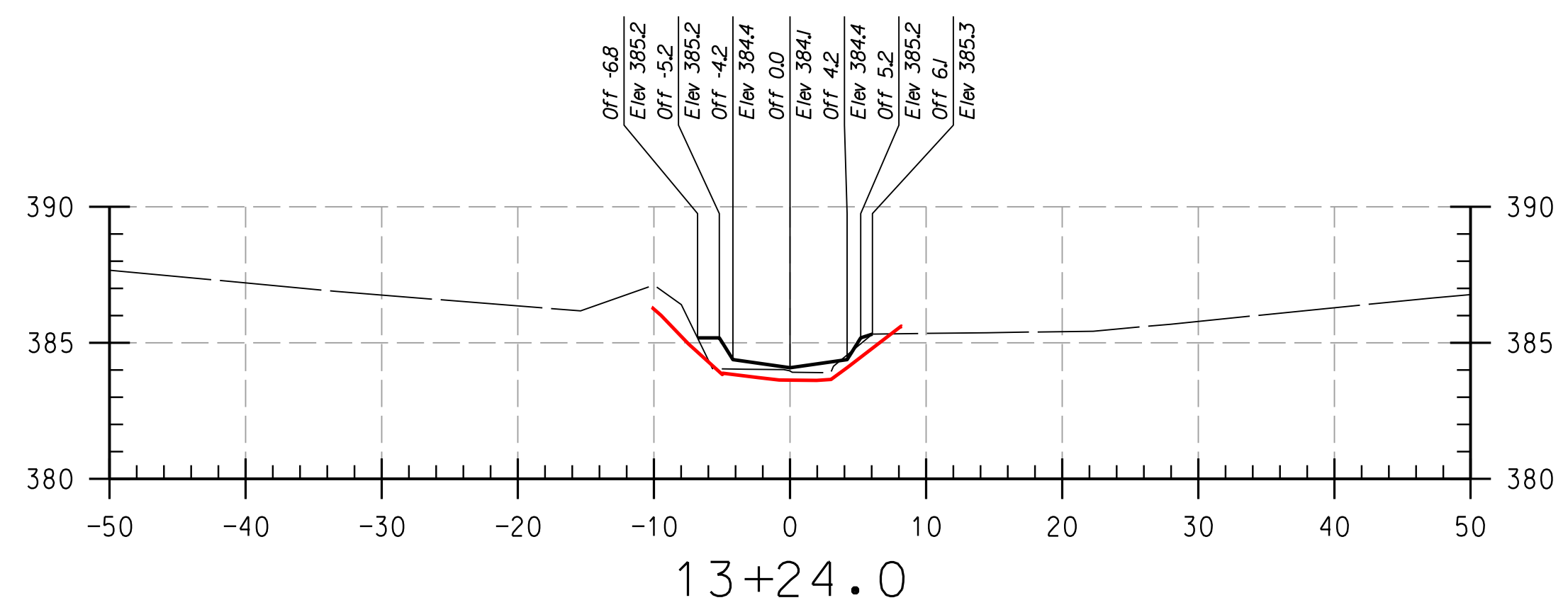
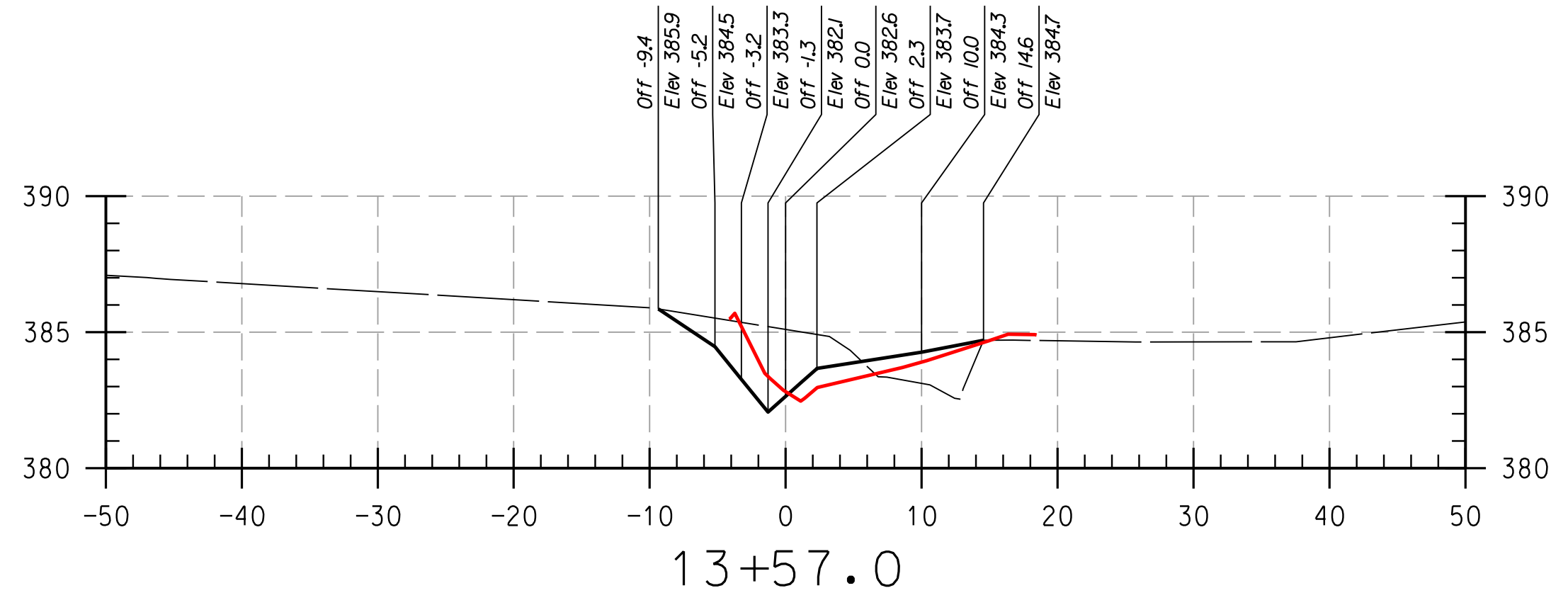
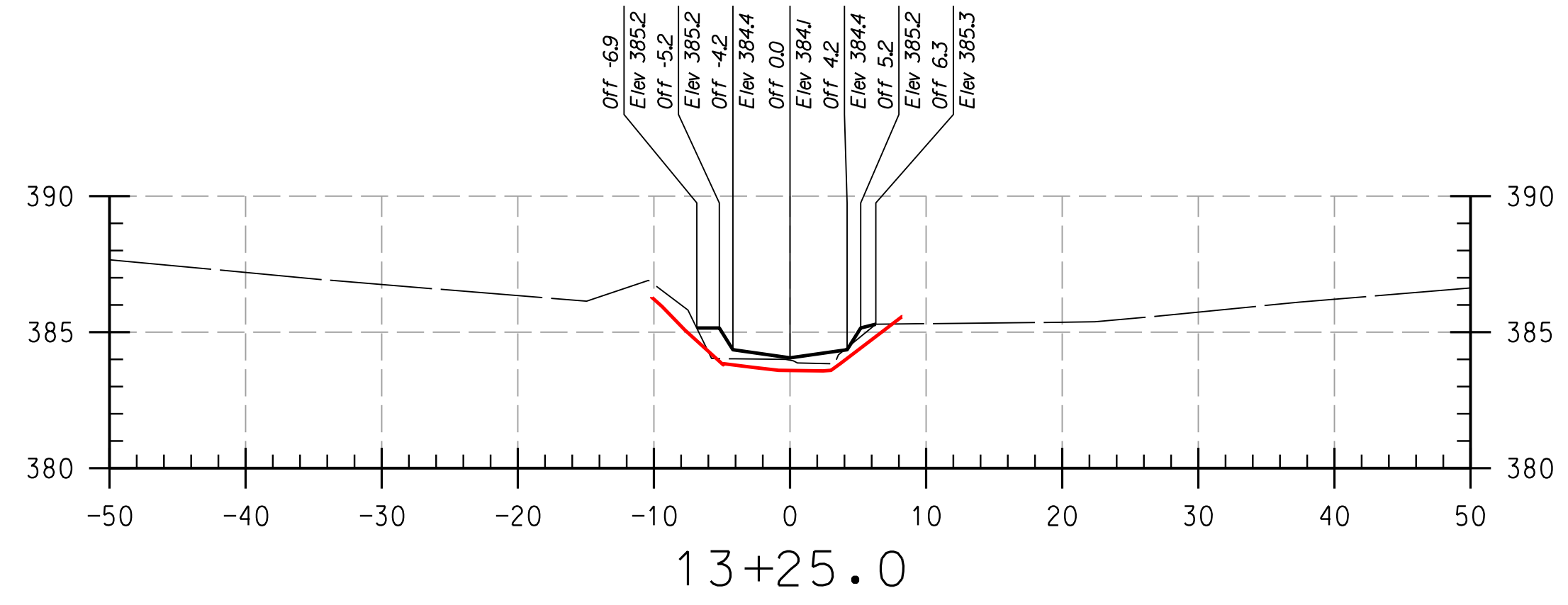
DATE: APRIL 2017

KCI JOB NO.: 17133314.83

CAPITAL PROJECT NO.: D-1158

PERMIT ISSUE:

CONSTRUCTION ISSUE:



REACH 2

LEGEND

EXISTING GRADE ———

PROPOSED GRADE ———

AS-BUILT GRADE ———

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HOWARD SCD _____ DATE _____

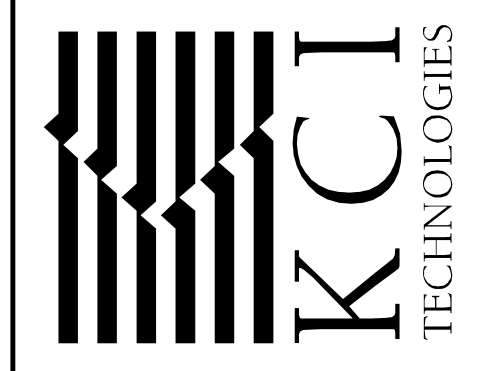
THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL
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DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES _____ DATE _____

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AS-BUILT
CROSS
SECTIONS

SCALE: HOR: 1" = 10'
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DATE: APRIL 2017

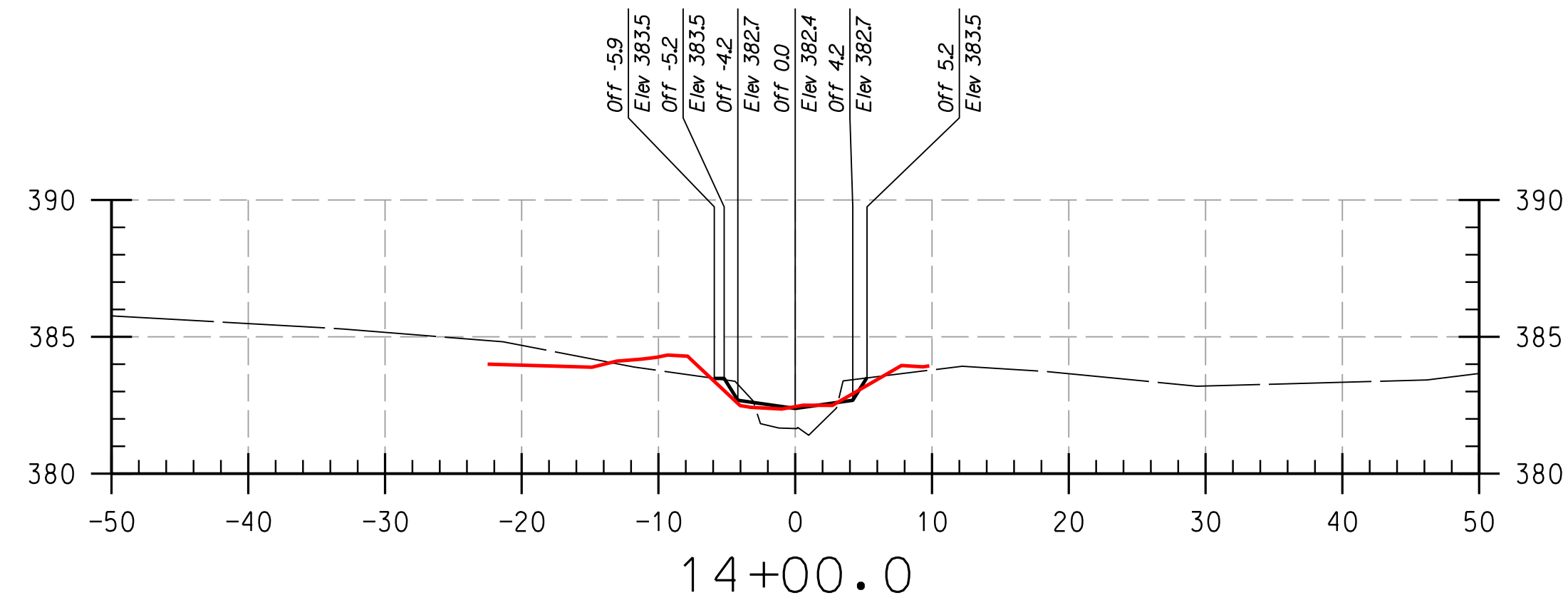
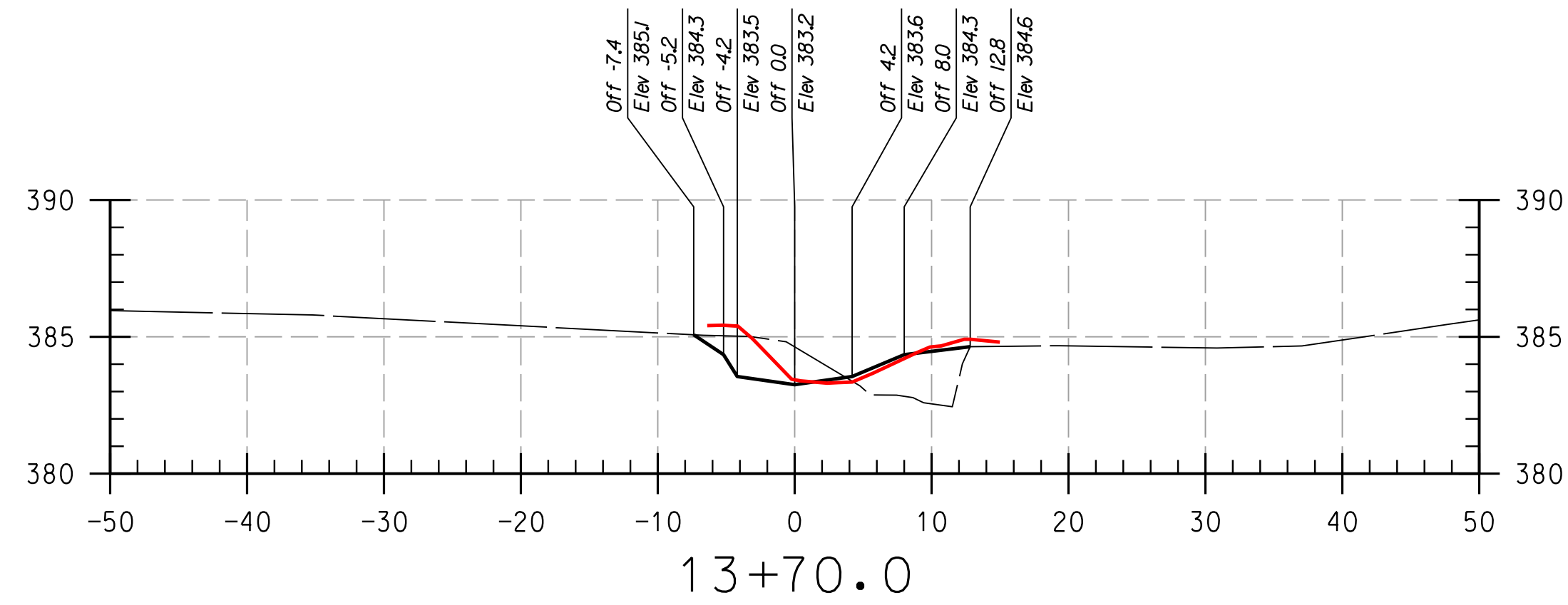
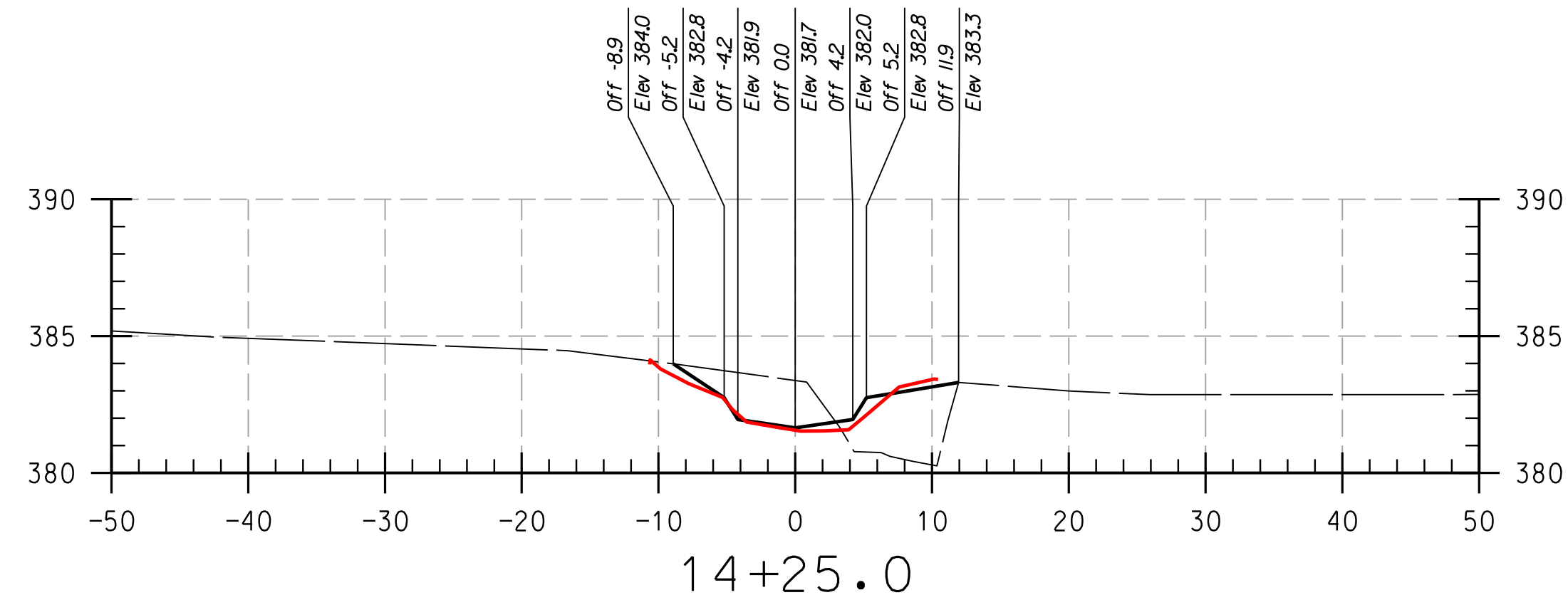
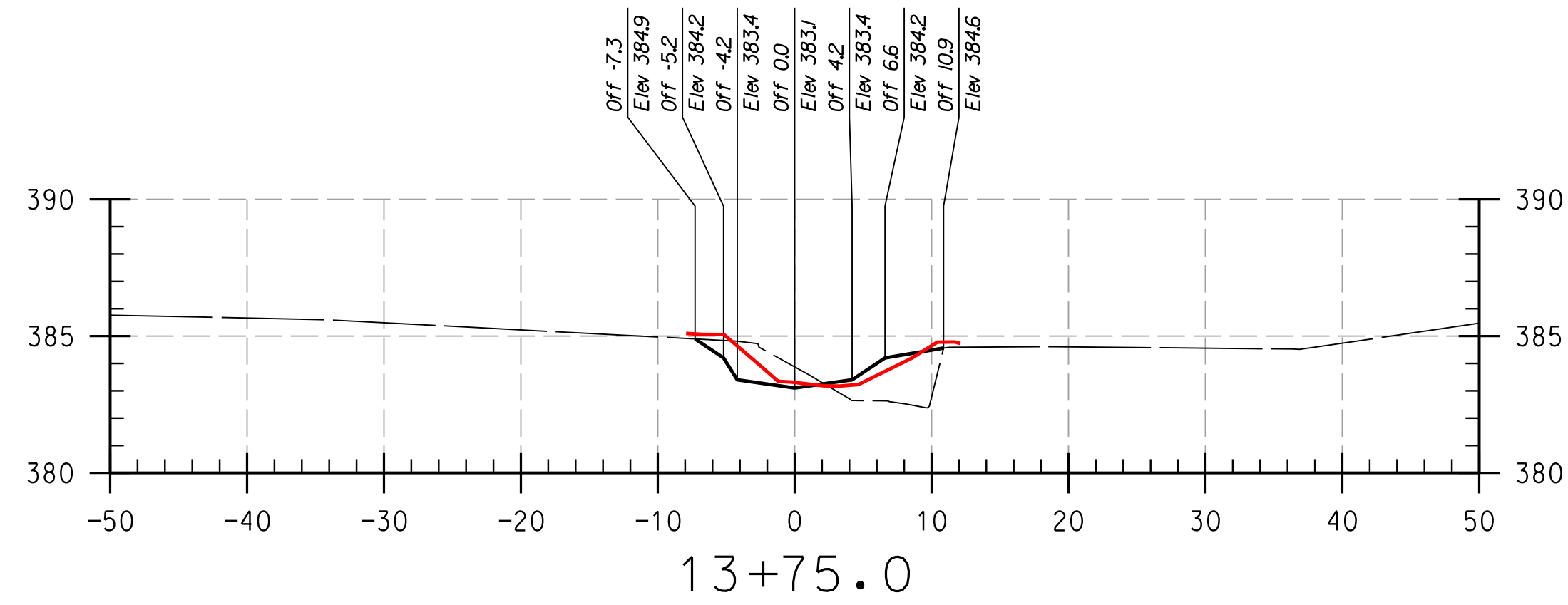
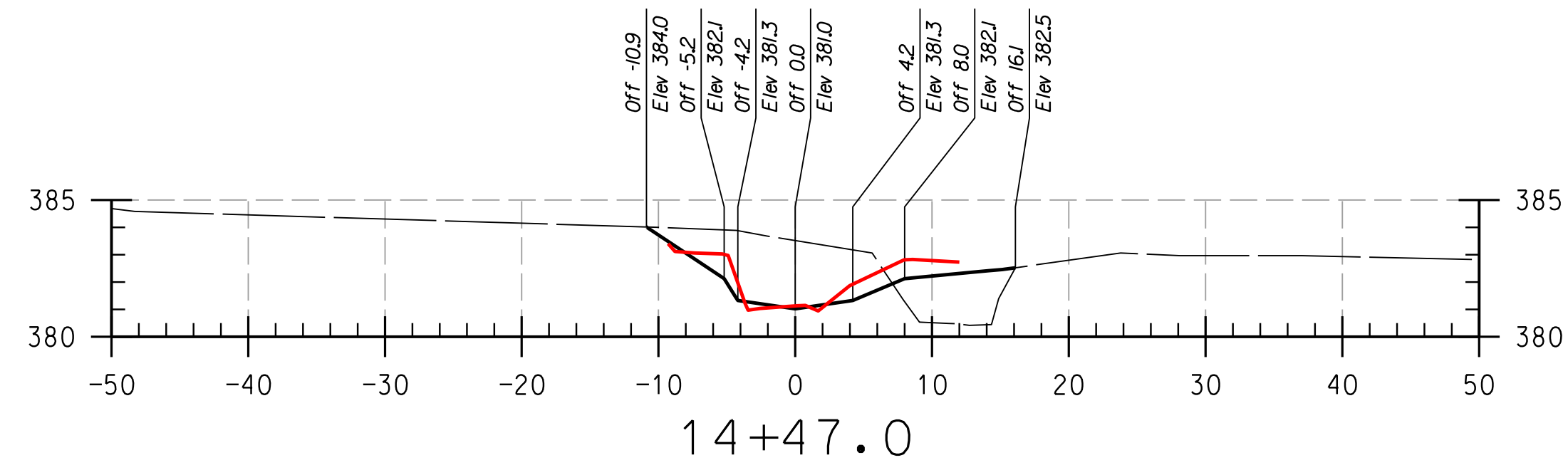
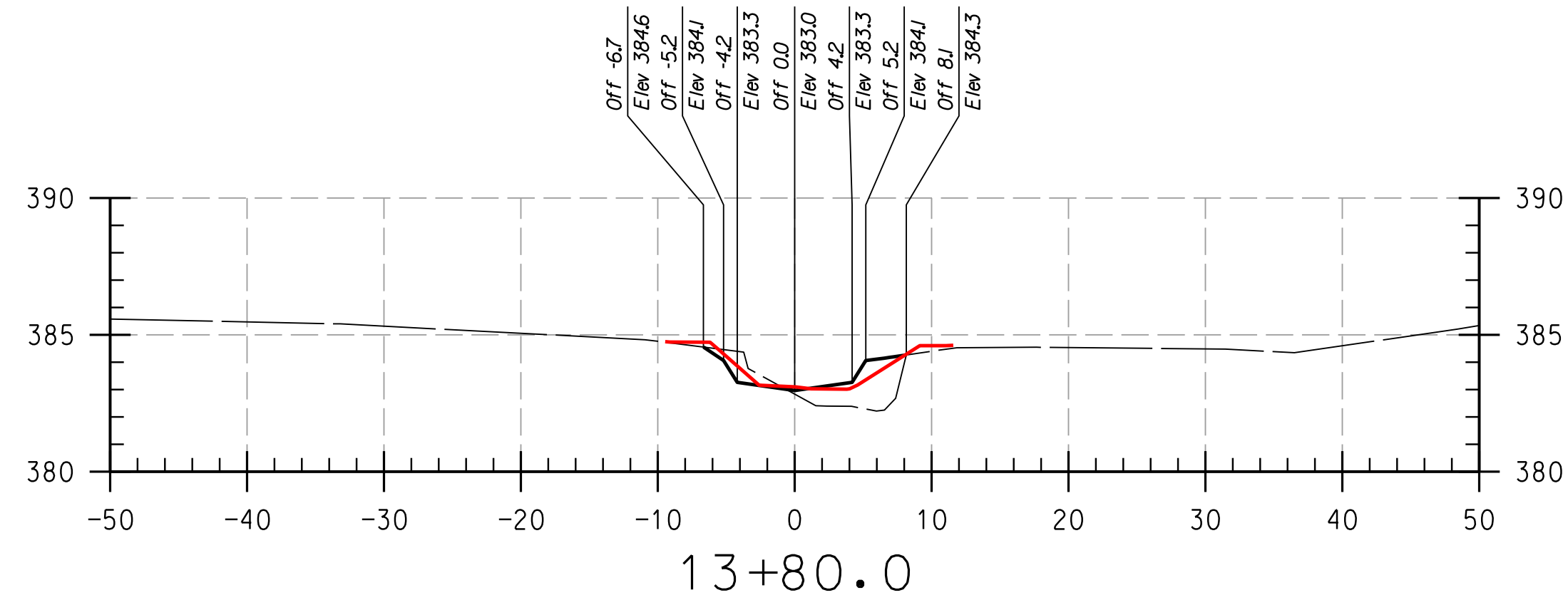
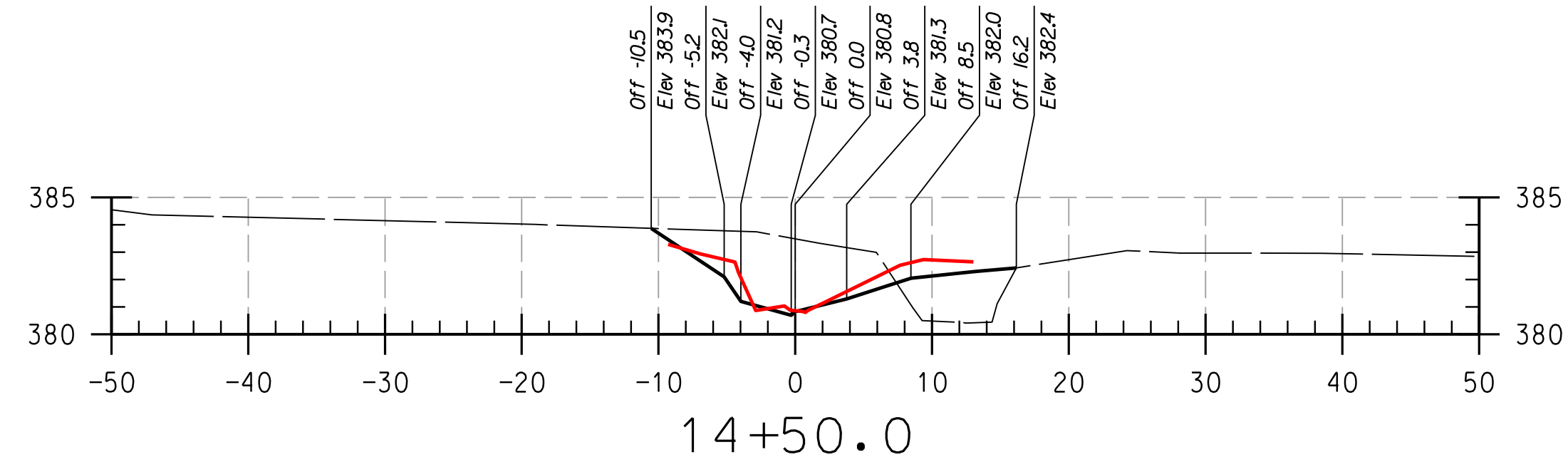
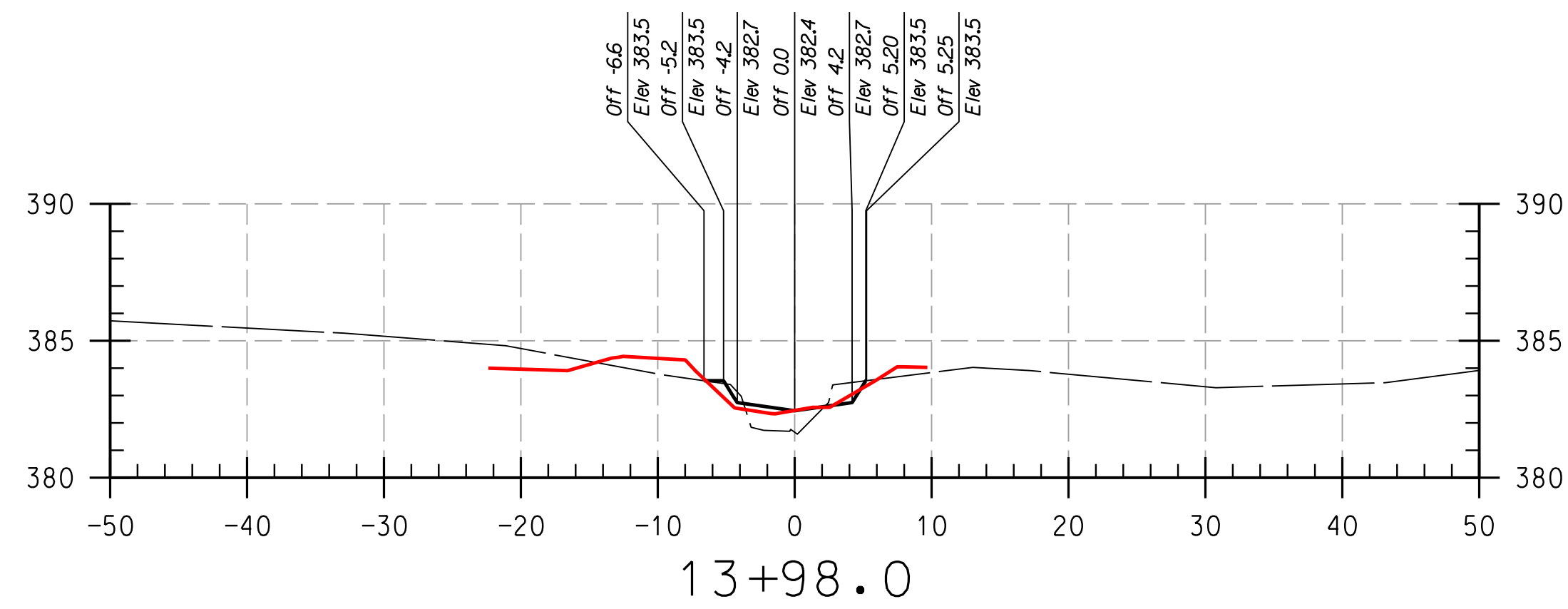
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CAPITAL PROJECT NO.: D-1158

PERMIT ISSUE: _____

CONSTRUCTION ISSUE: _____

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BY: D:\s\cad\dd... Files\Howard\CC\p25-p001_Howard CC - As-Built.dgn



REACH 2

LEGEND	
EXISTING GRADE	---
PROPOSED GRADE	—
AS-BUILT GRADE	—

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HOWARD SCD _____ DATE _____

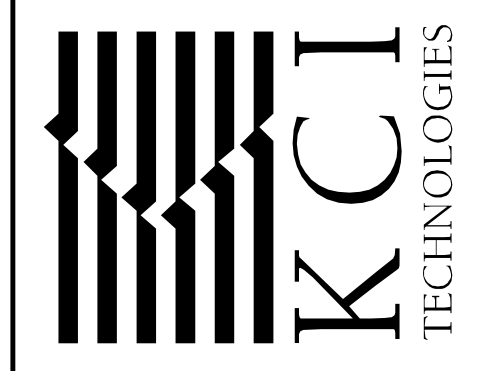
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NO.	REVISIONS DESCRIPTION	DATE

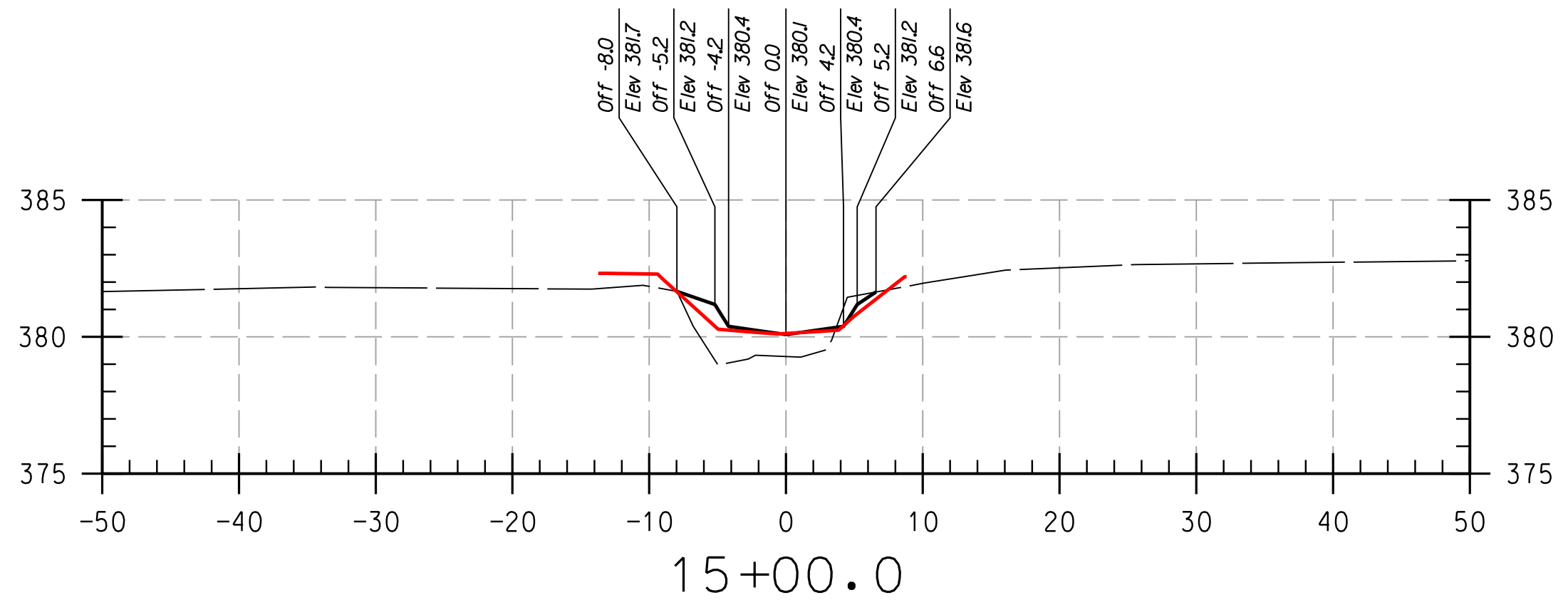
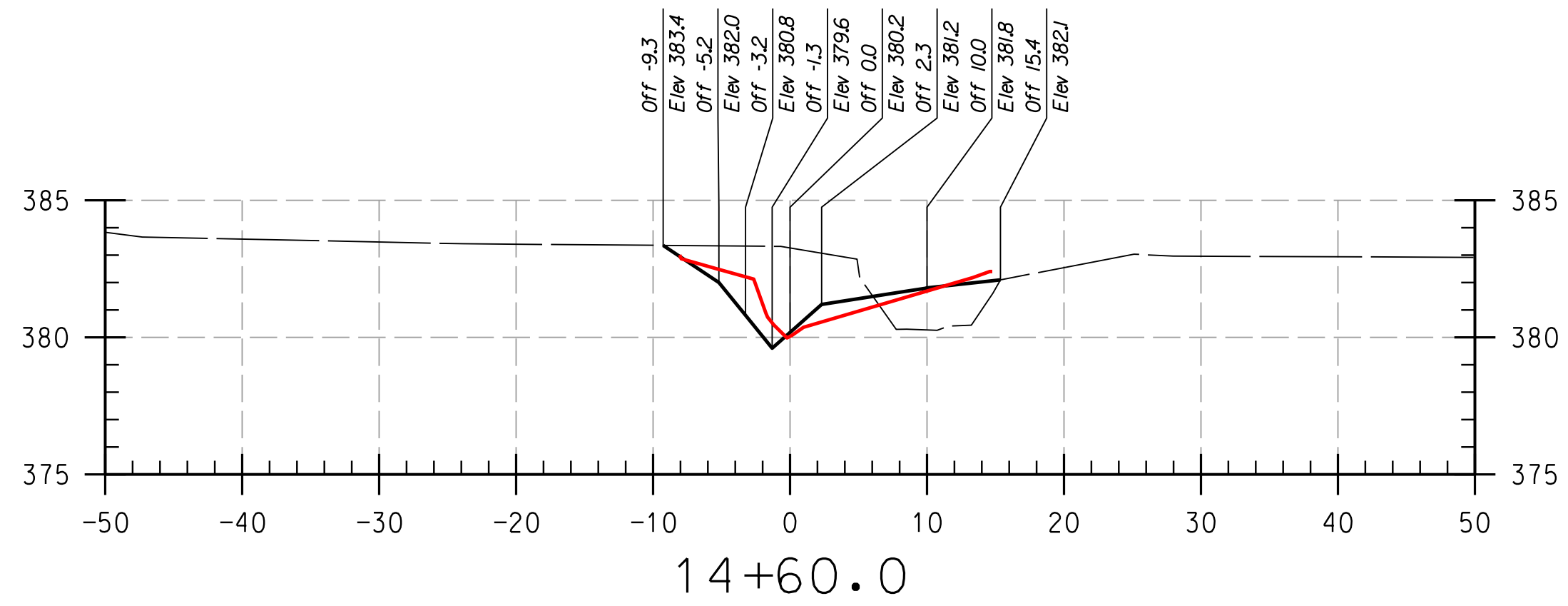
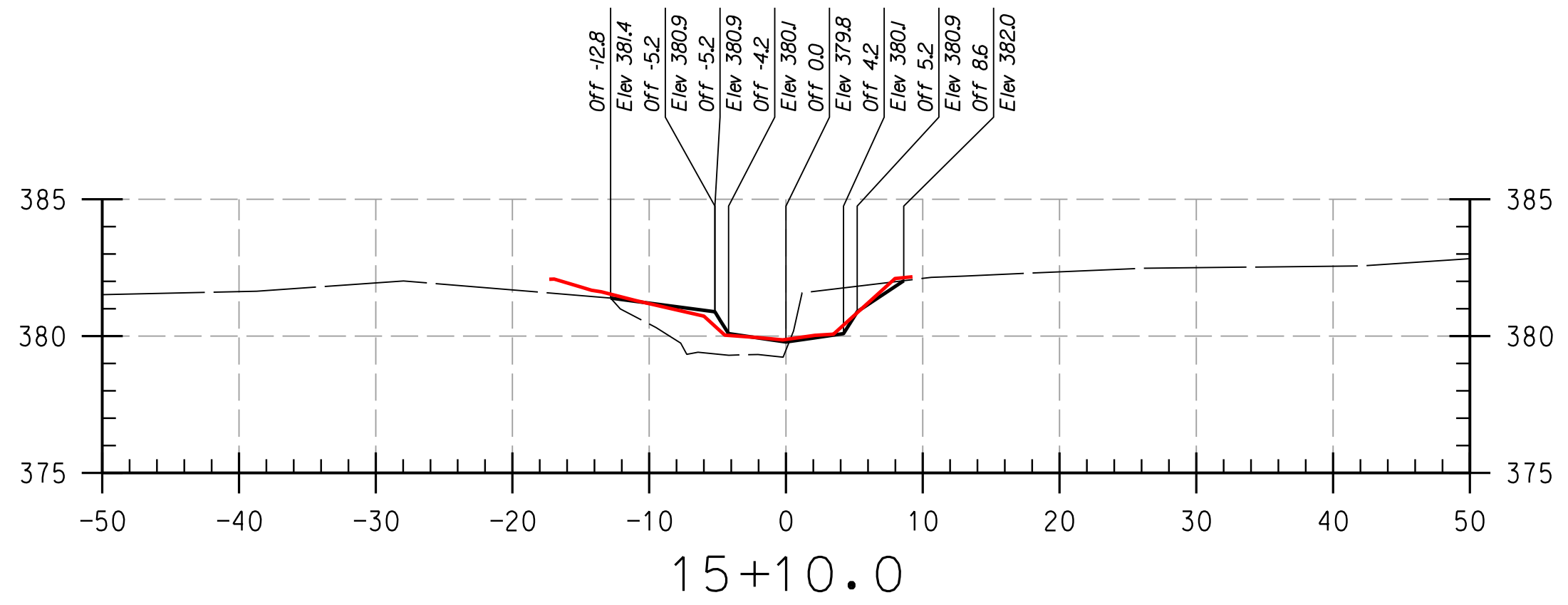
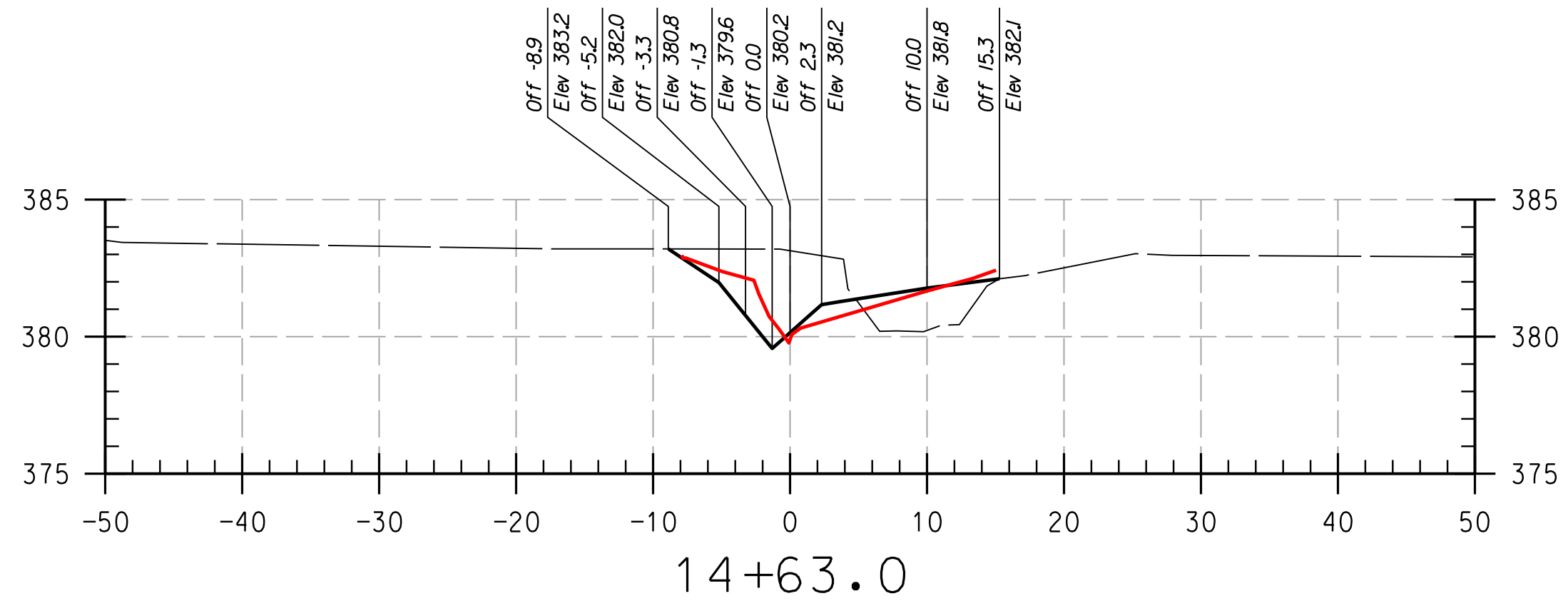
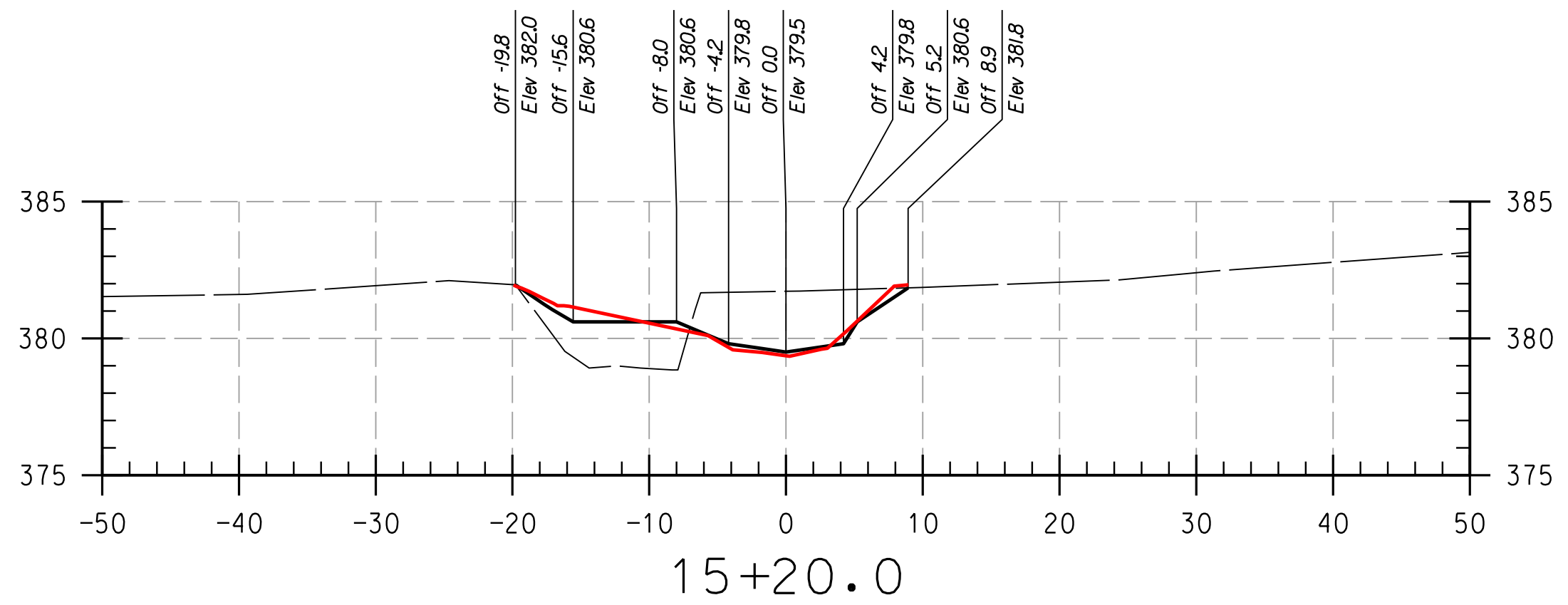
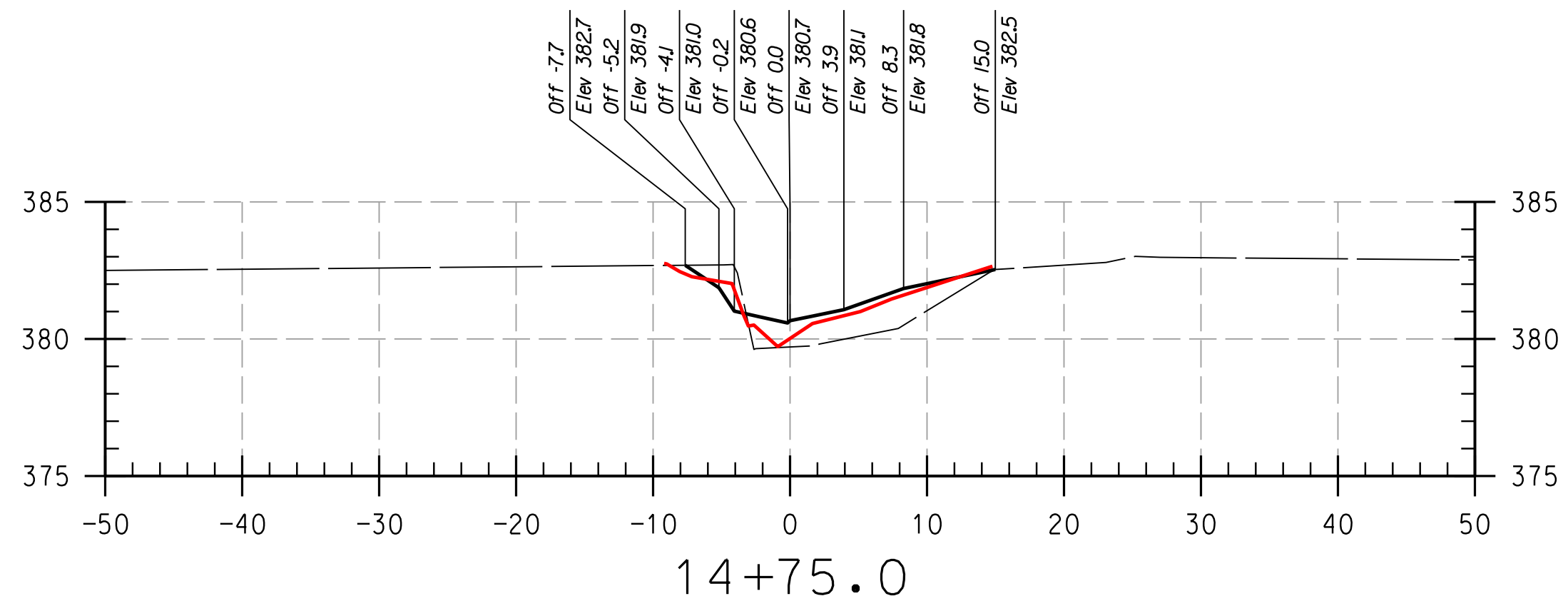
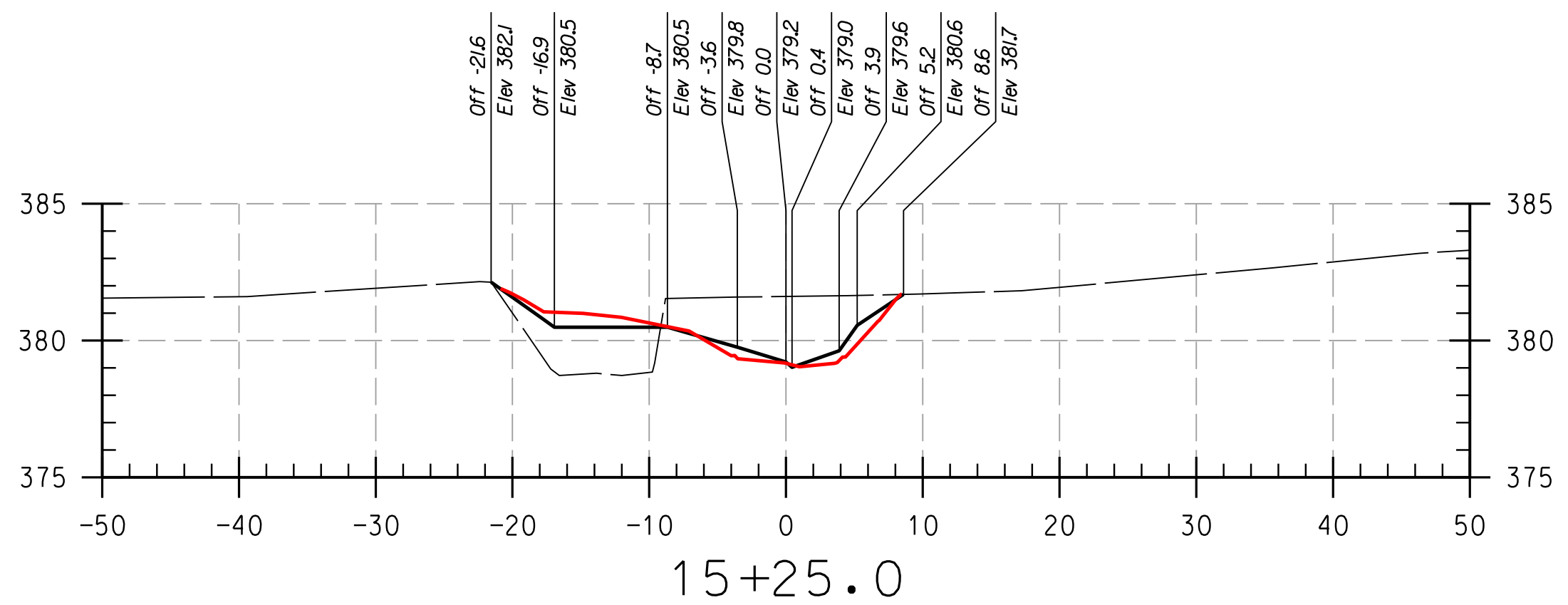
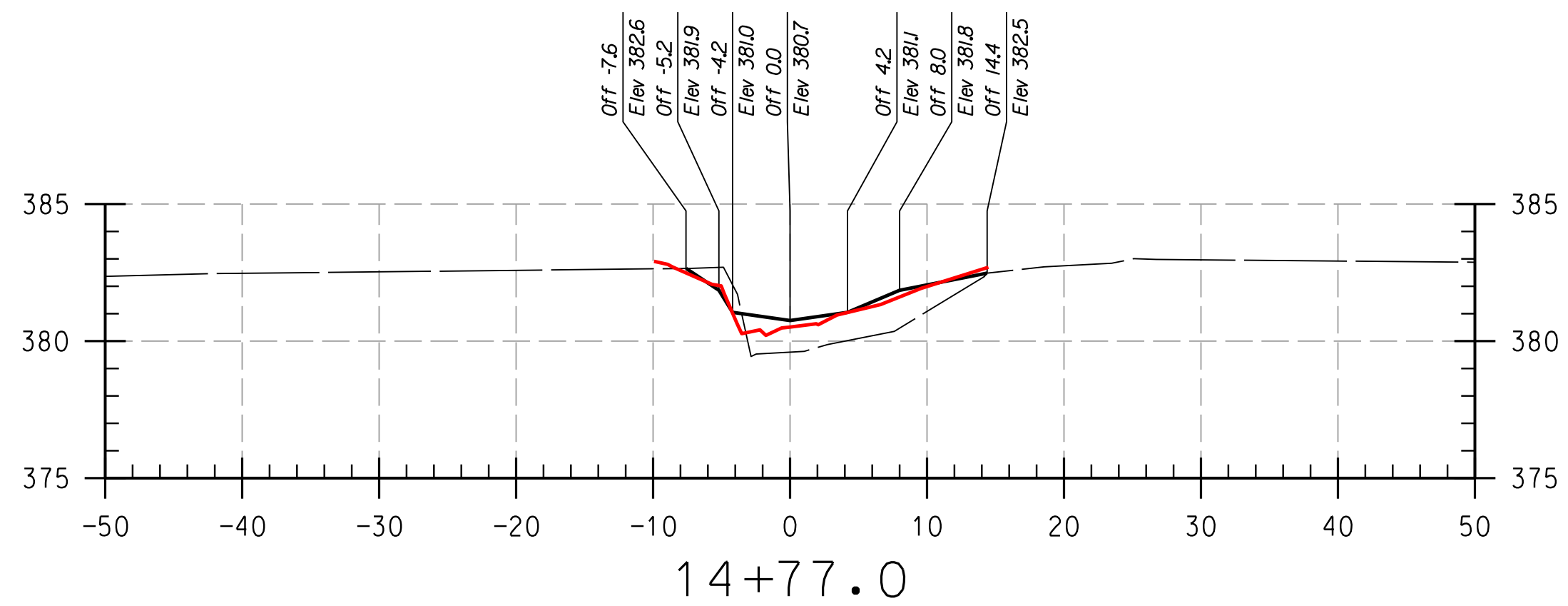
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**HOWARD COMMUNITY COLLEGE
STREAM RESTORATION PROJECT**
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 47, 81 TAX MAP 35.36
ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

**AS-BUILT
CROSS
SECTIONS**

SCALE:	HOR: 1" = 10'
	VERT: 1" = 5'
DATE:	APRIL 2017
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	



REACH 2

LEGEND

EXISTING GRADE	-----
PROPOSED GRADE	_____
AS-BUILT GRADE	_____

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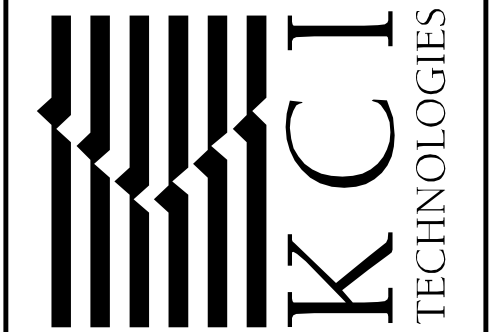
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DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

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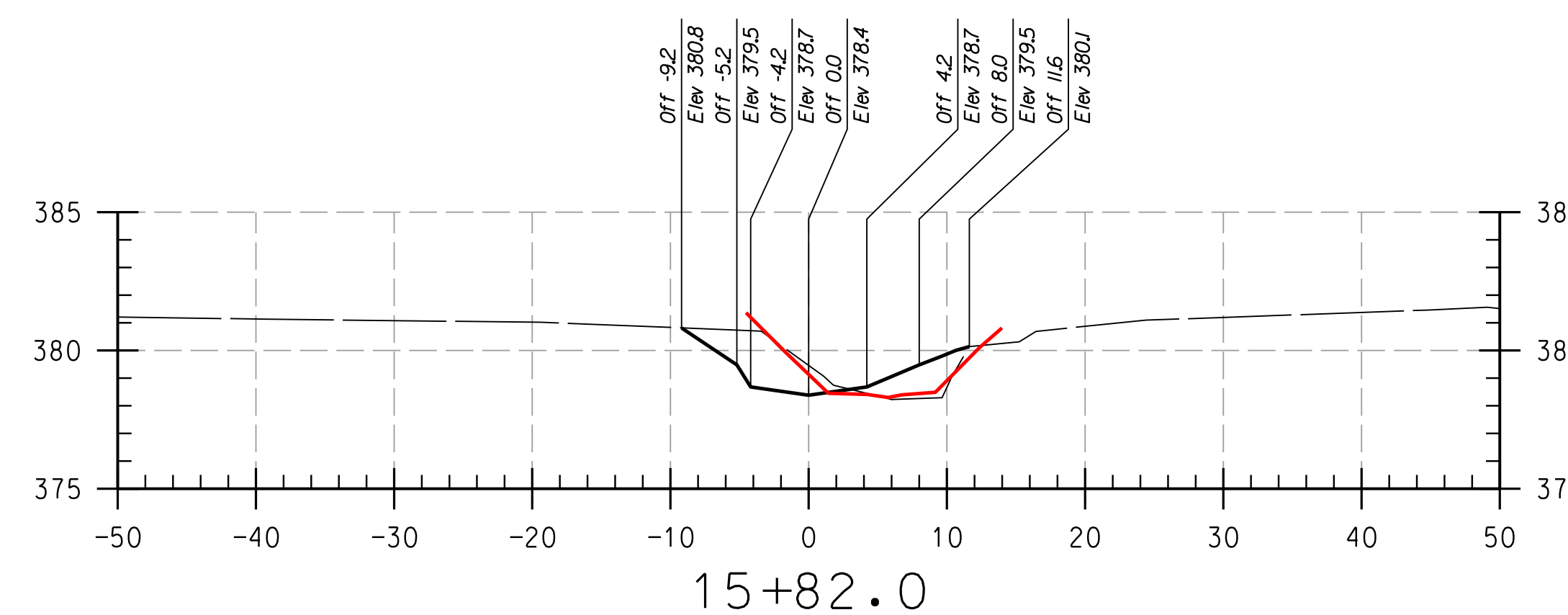
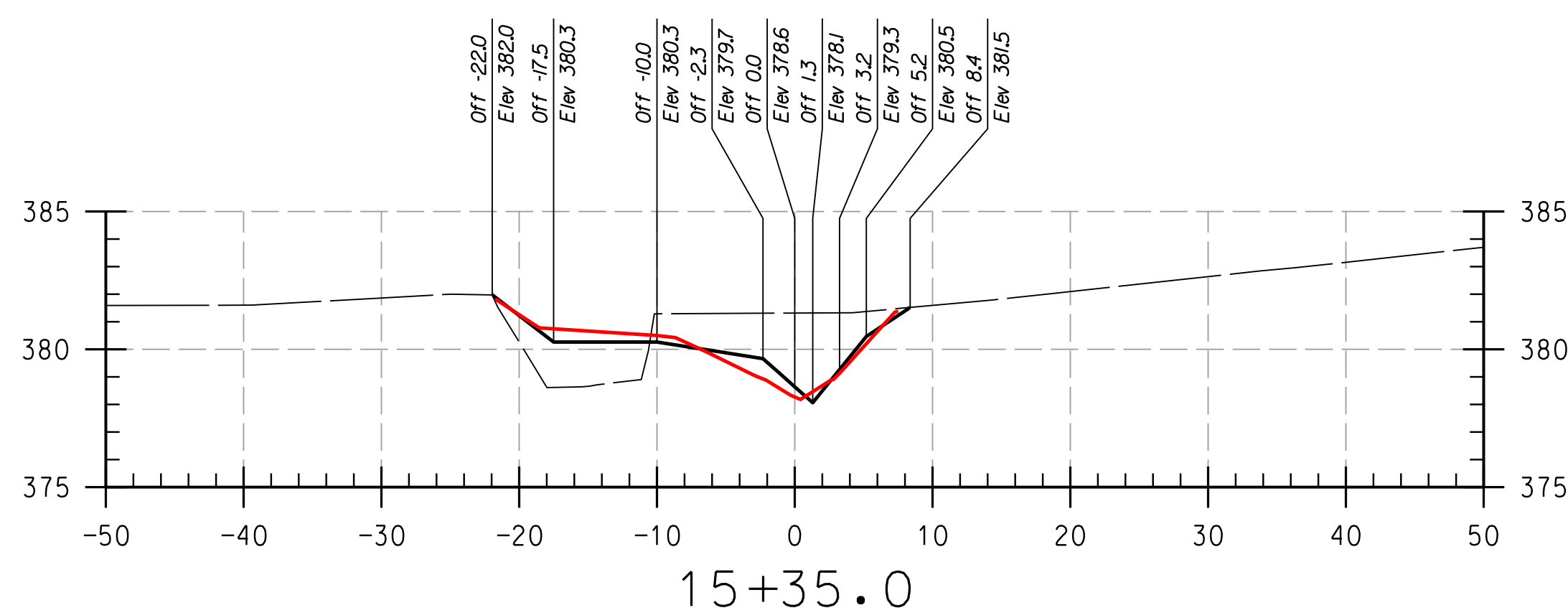
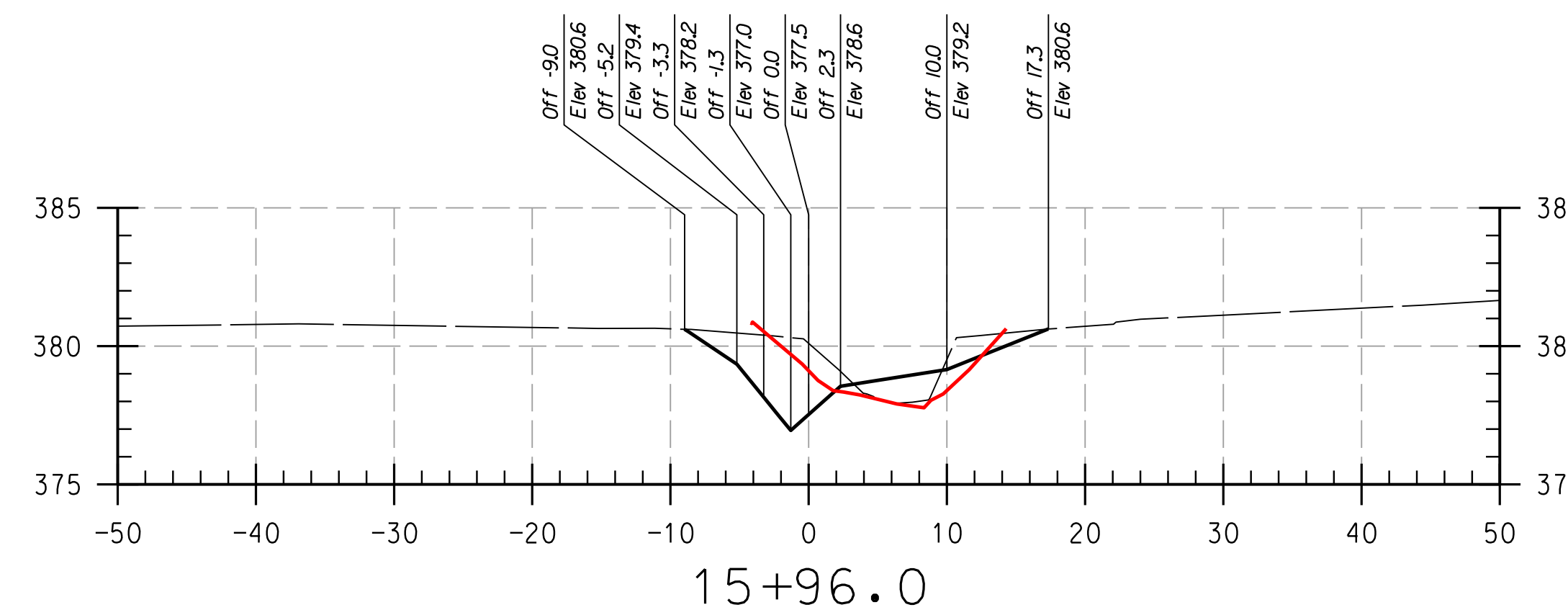
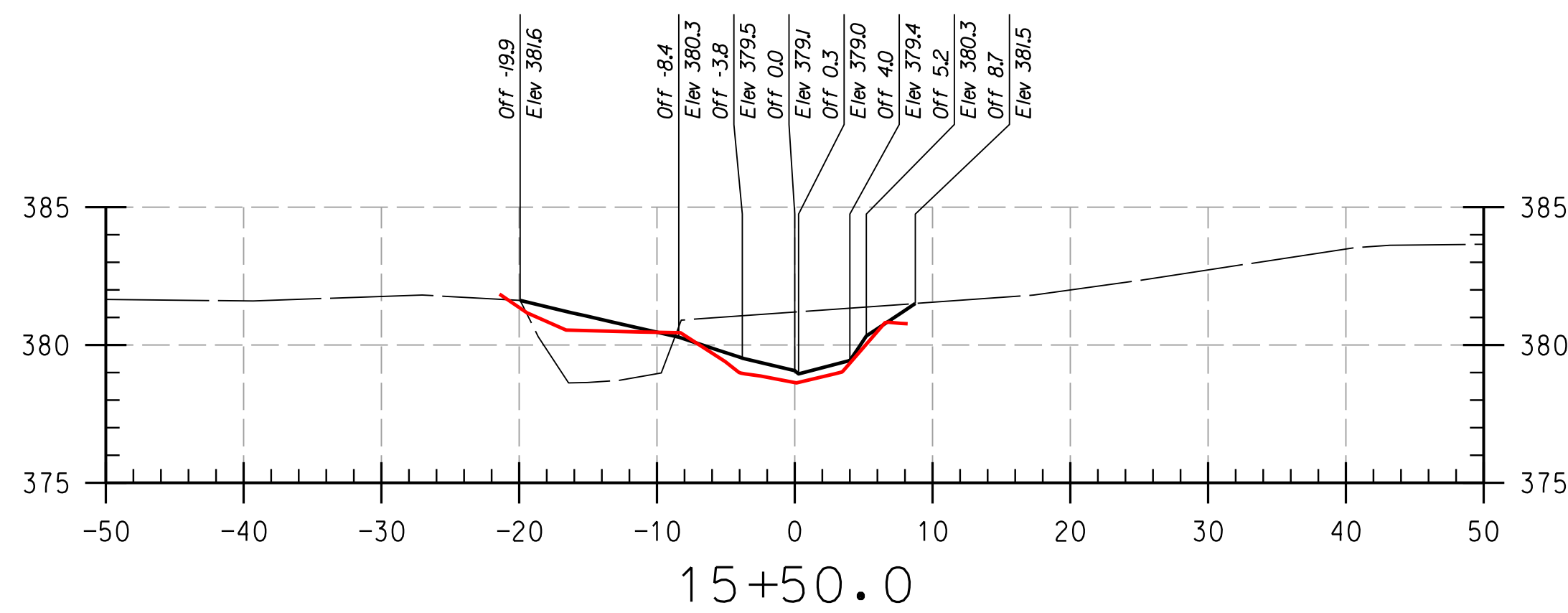
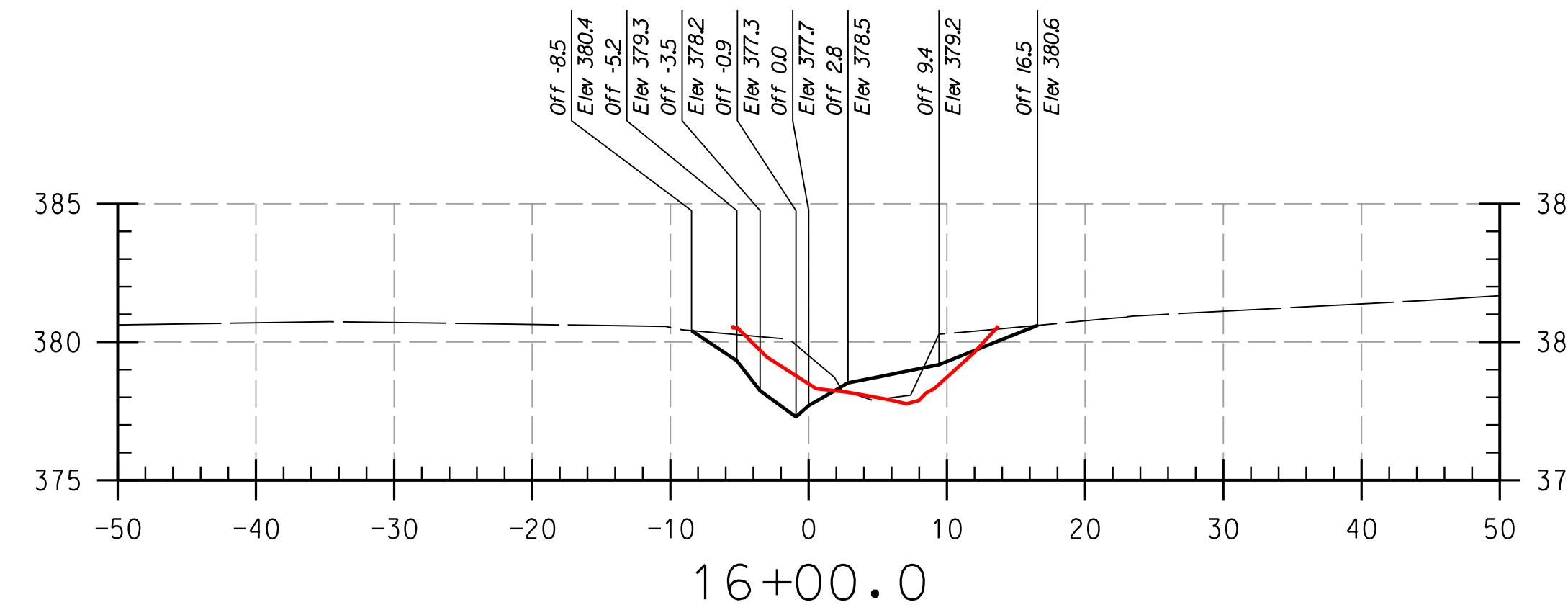
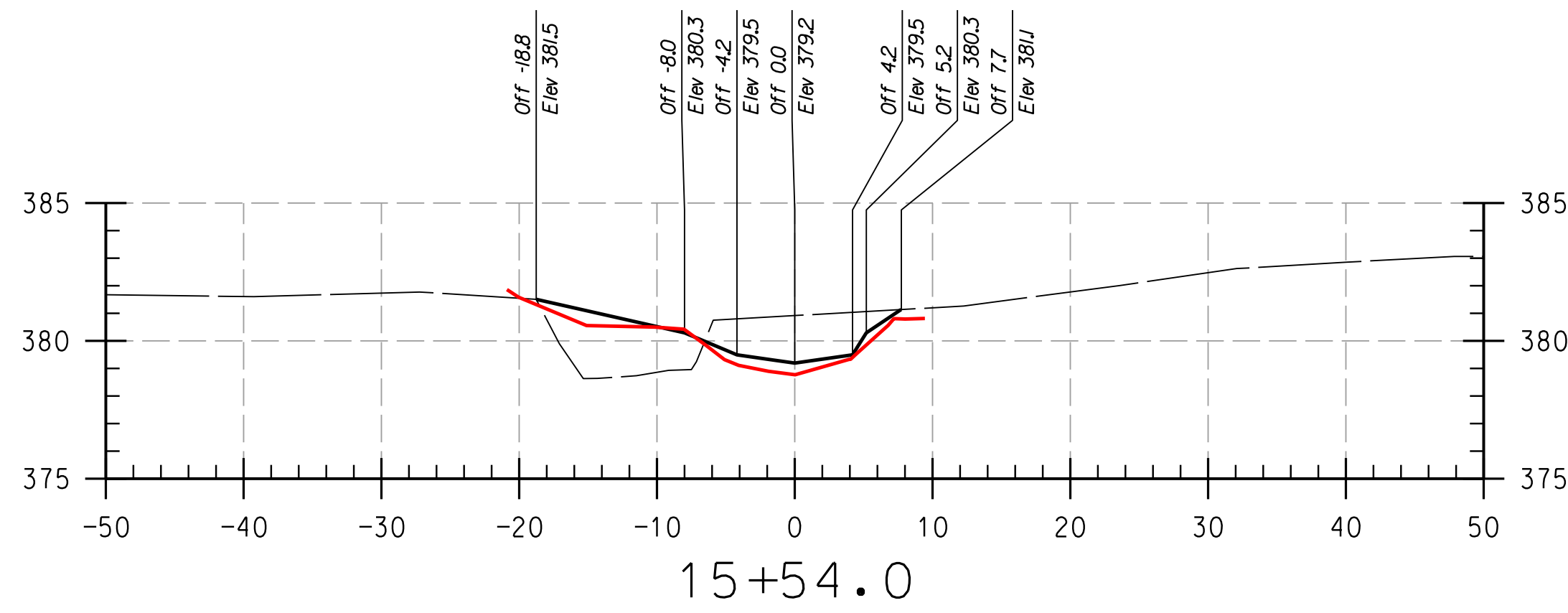
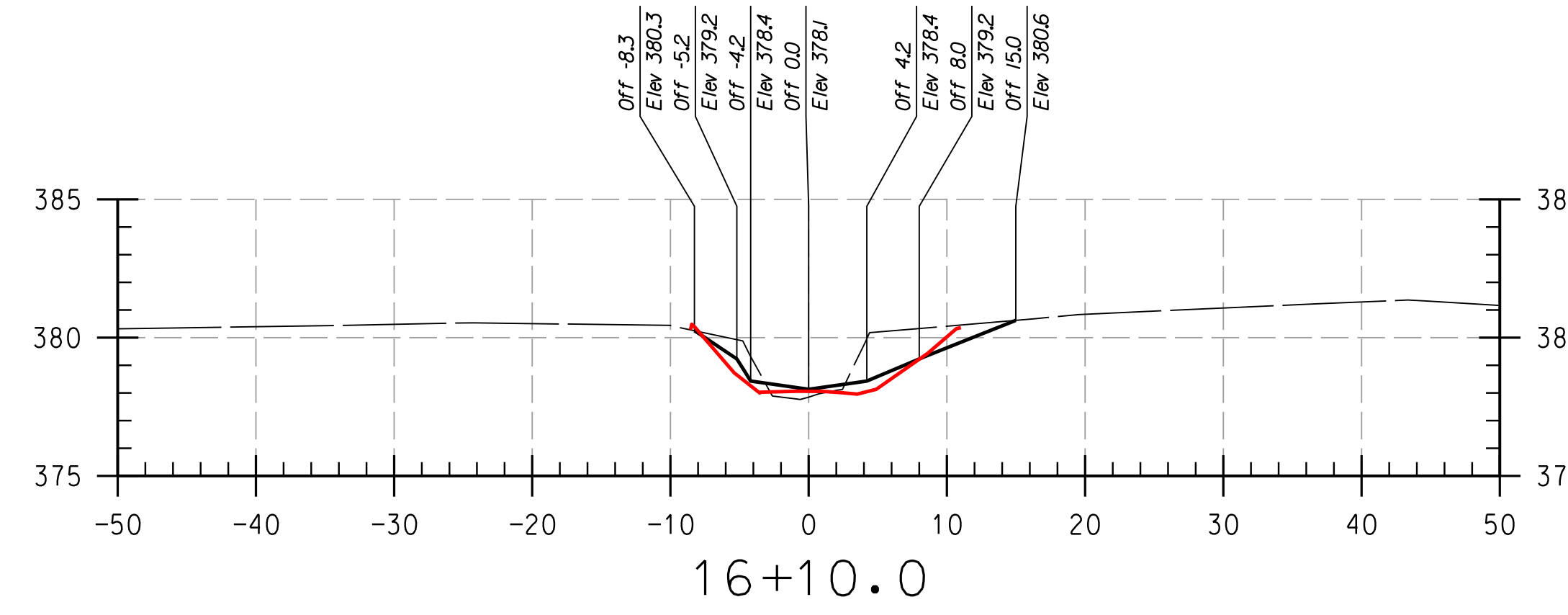
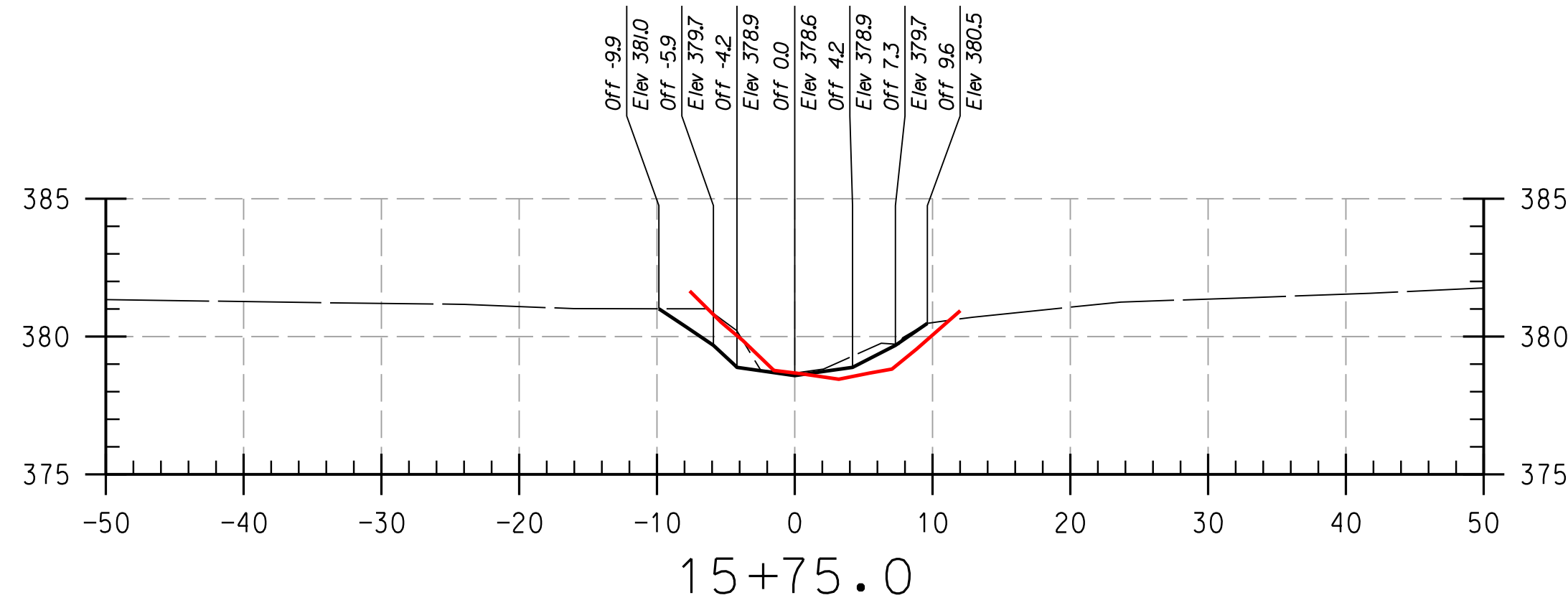
HOWARD COMMUNITY COLLEGE
 STREAM RESTORATION PROJECT
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AS-BUILT
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 SECTIONS

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PLOTTED: 12:28 PM on Monday, April 24, 2017
 BY: Division
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REACH 2

LEGEND

EXISTING GRADE	
PROPOSED GRADE	
AS-BUILT GRADE	

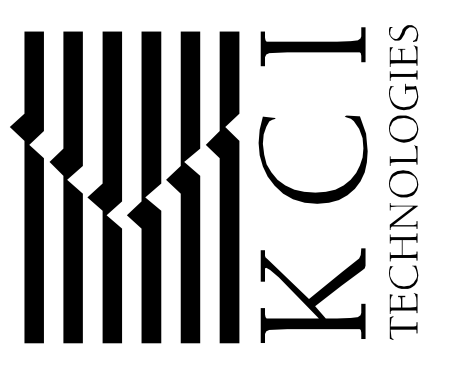
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HOWARD SCD	DATE	CHIEF, BUREAU OF ENVIRONMENTAL SERVICES	DATE

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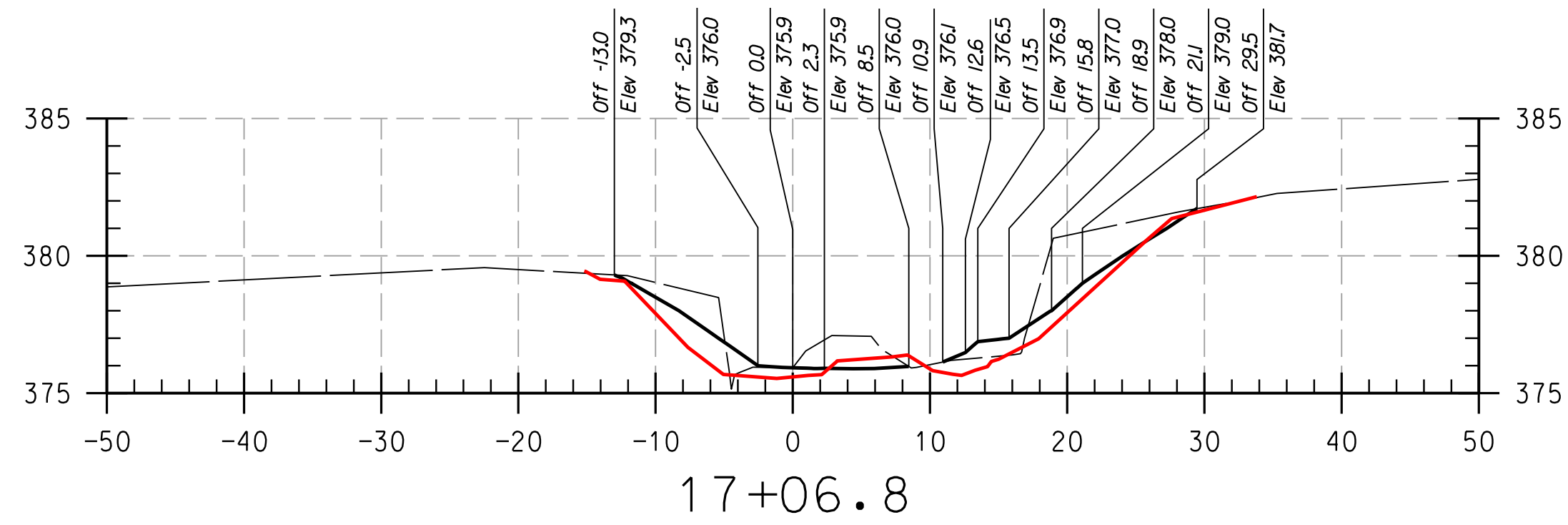
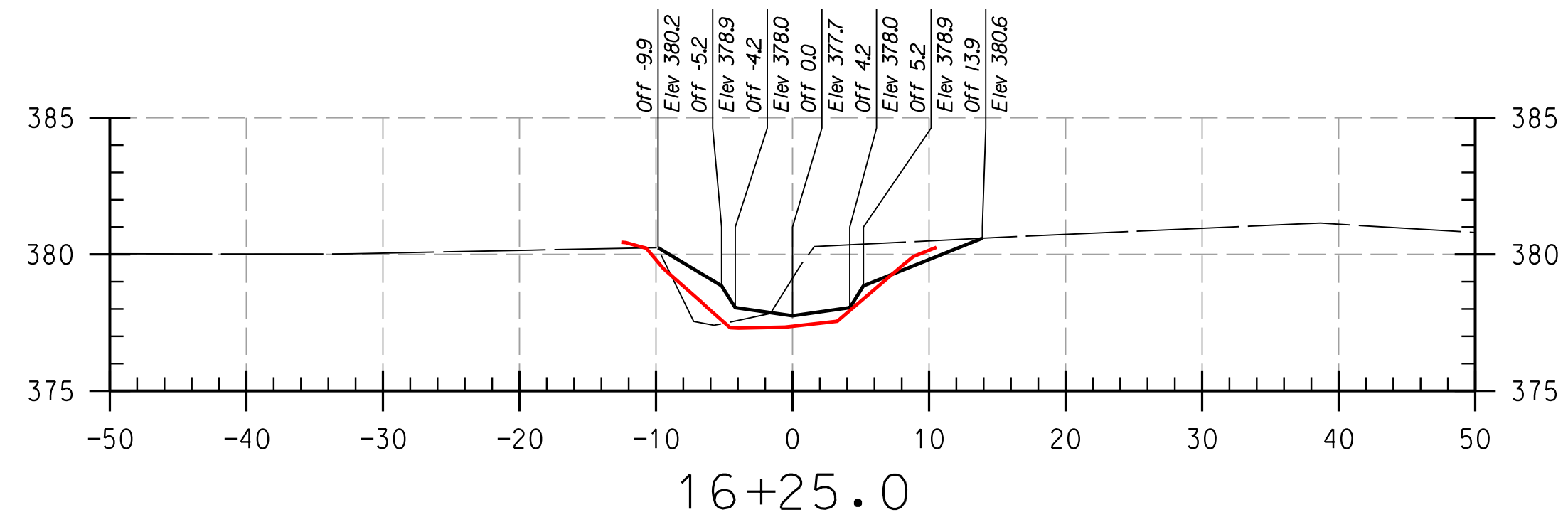
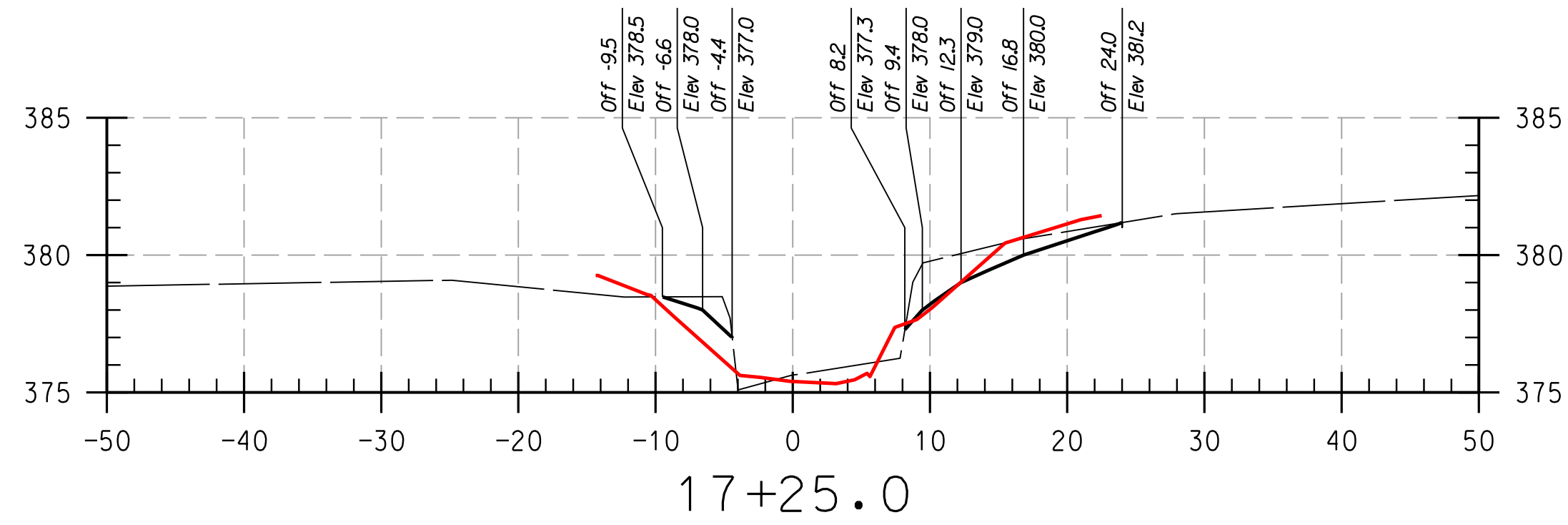
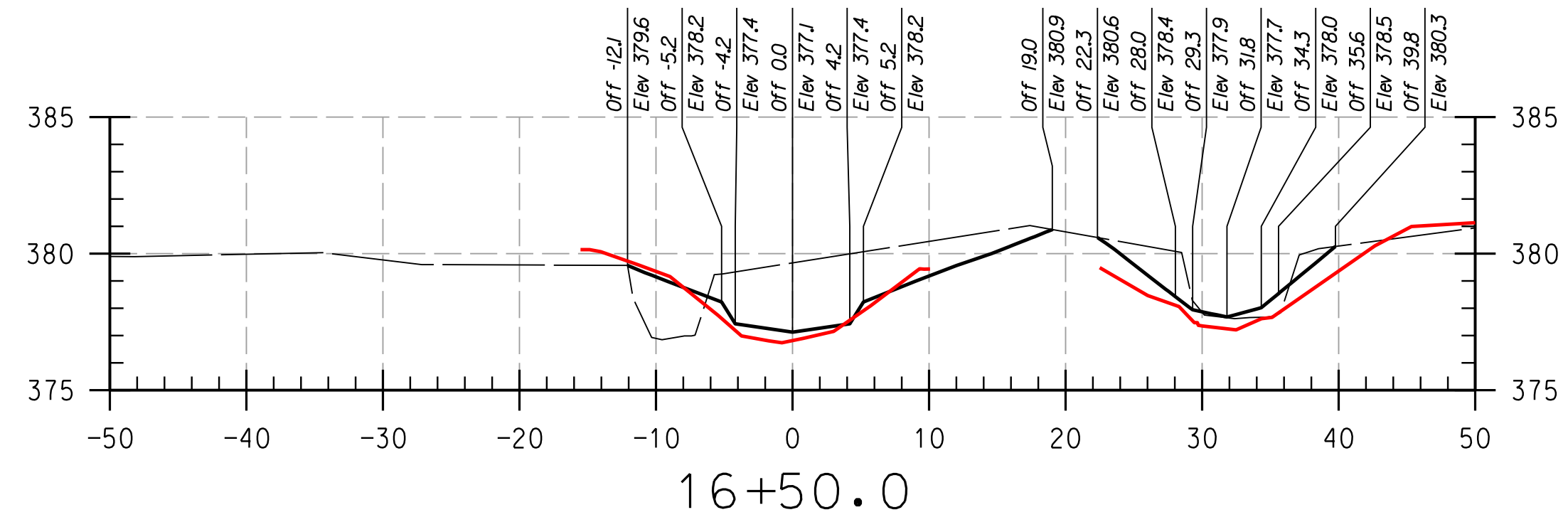
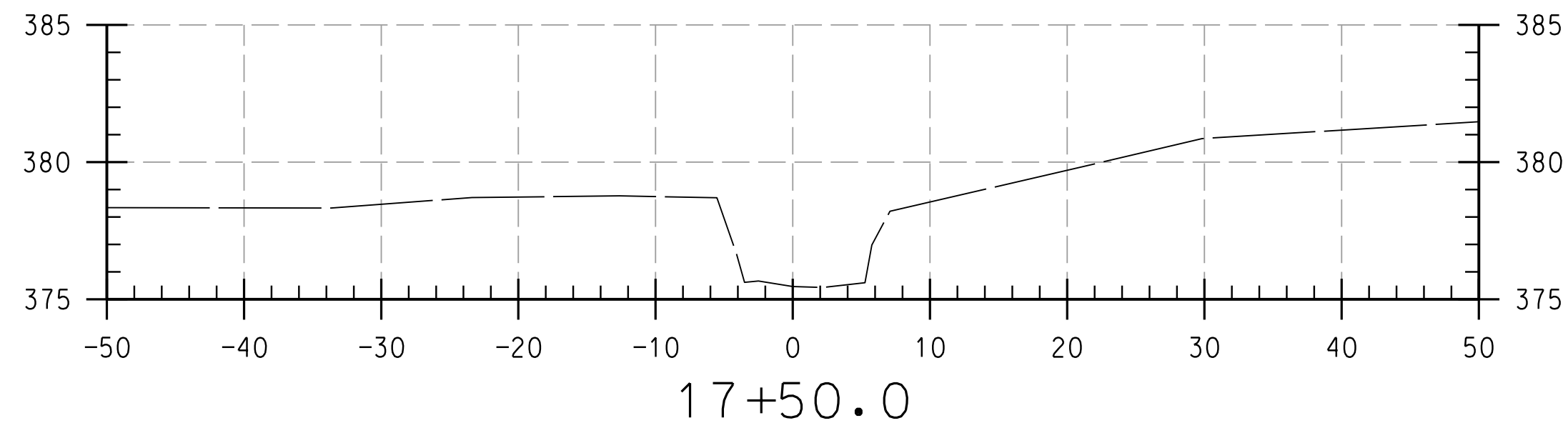
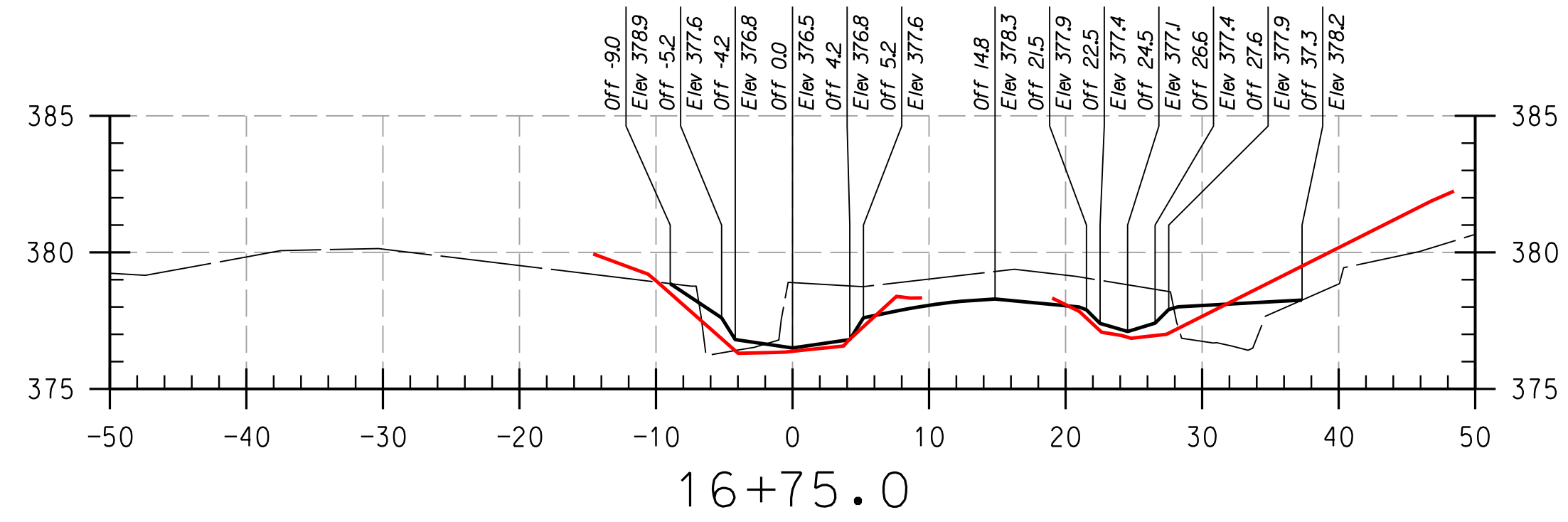
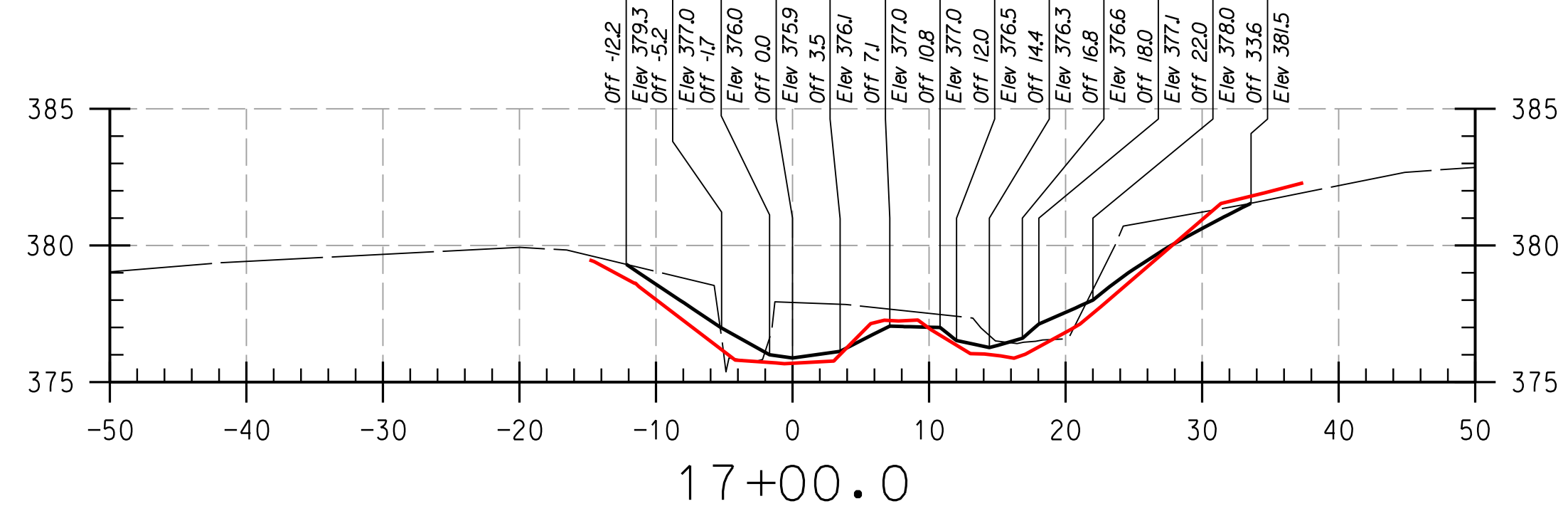
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PARCELS 47, 81 TAX MAP 35.36
ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

**AS-BUILT
CROSS
SECTIONS**

SCALE:	HOR: 1" = 10' VERT: 1" = 5'
DATE:	APRIL 2017
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	



REACH 2

LEGEND

EXISTING GRADE	—
PROPOSED GRADE	—
AS-BUILT GRADE	—

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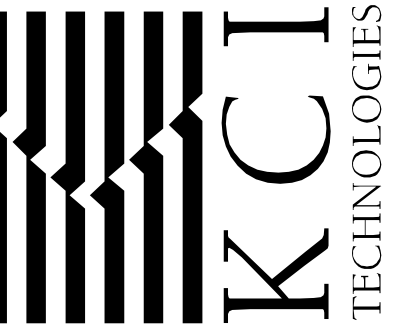
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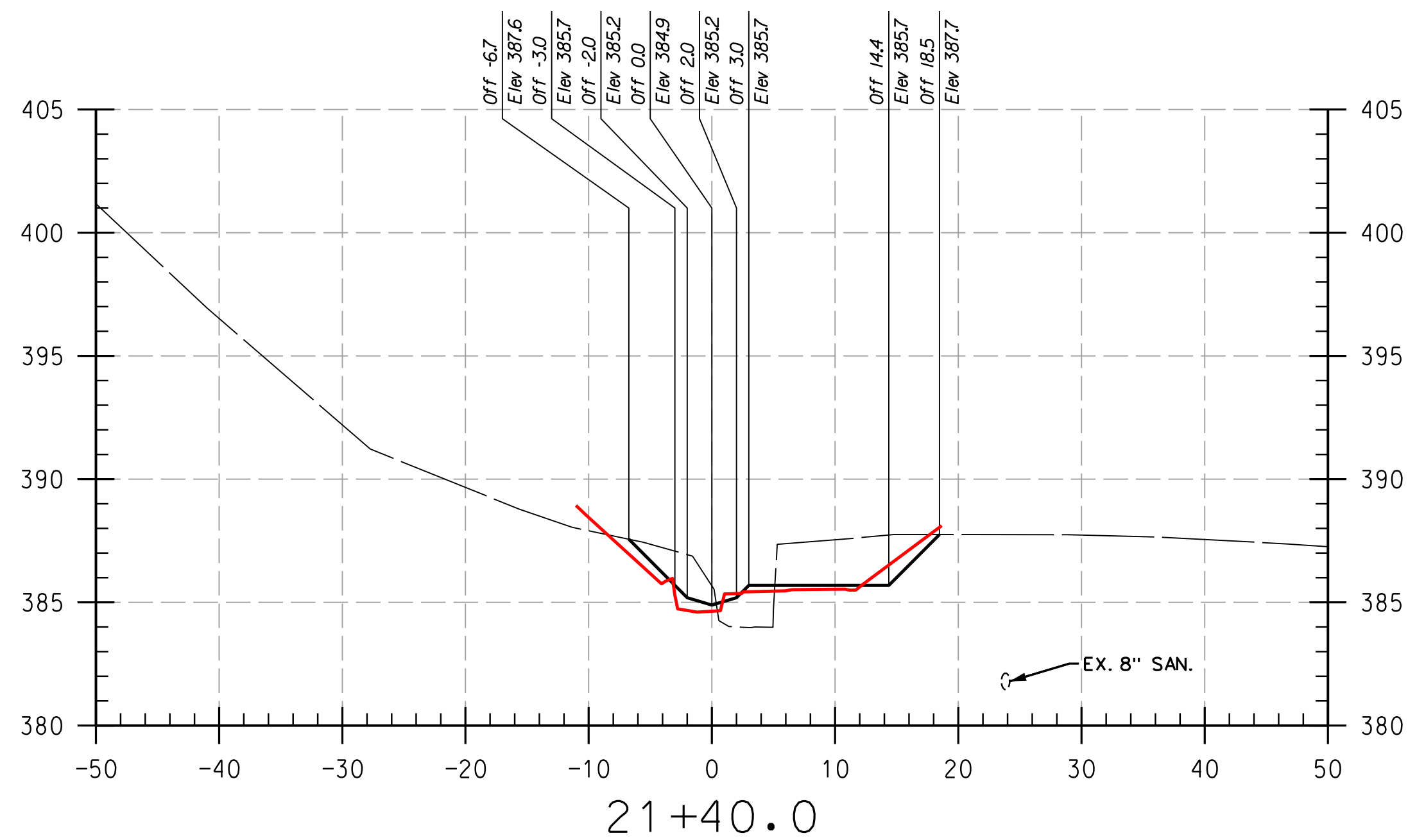
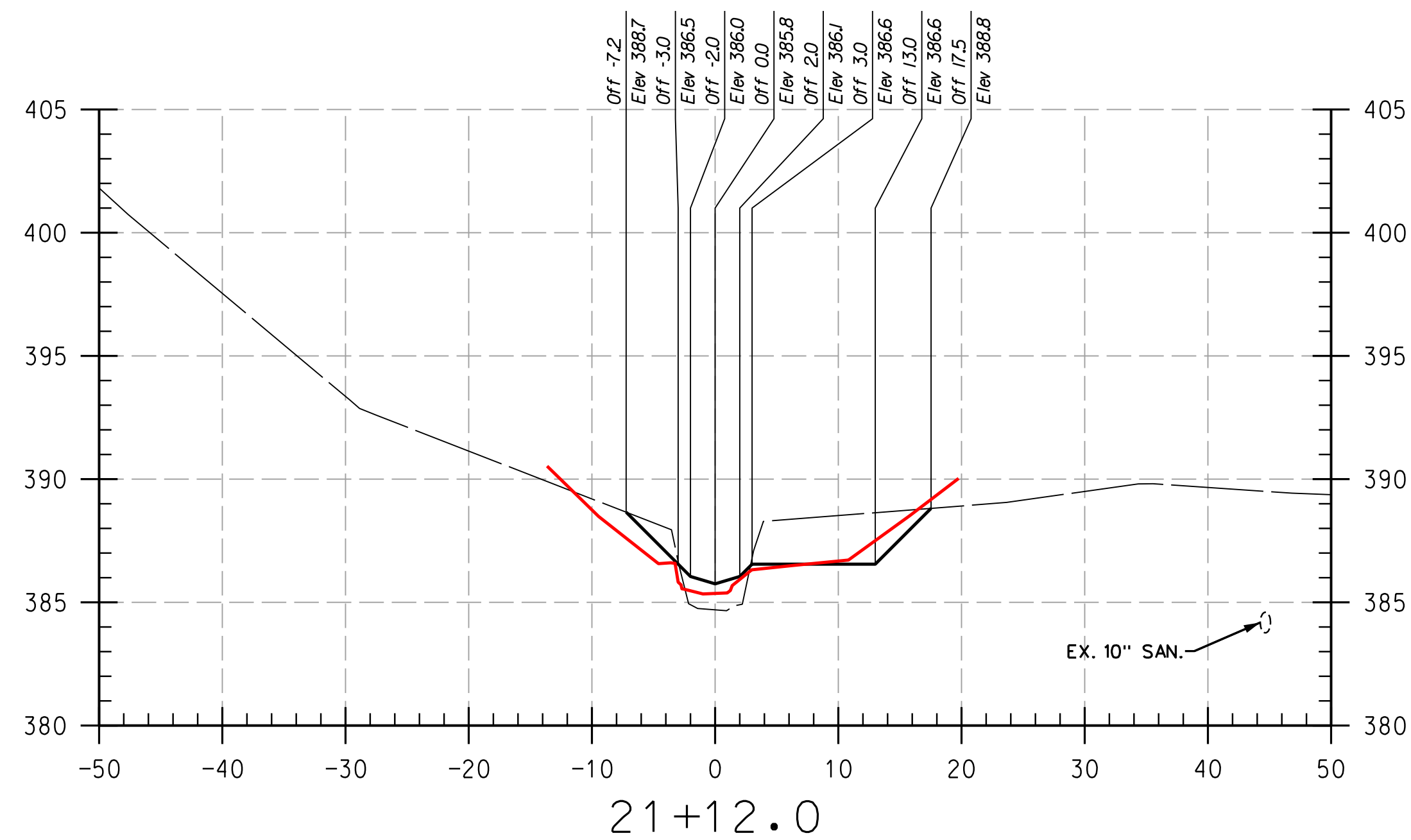
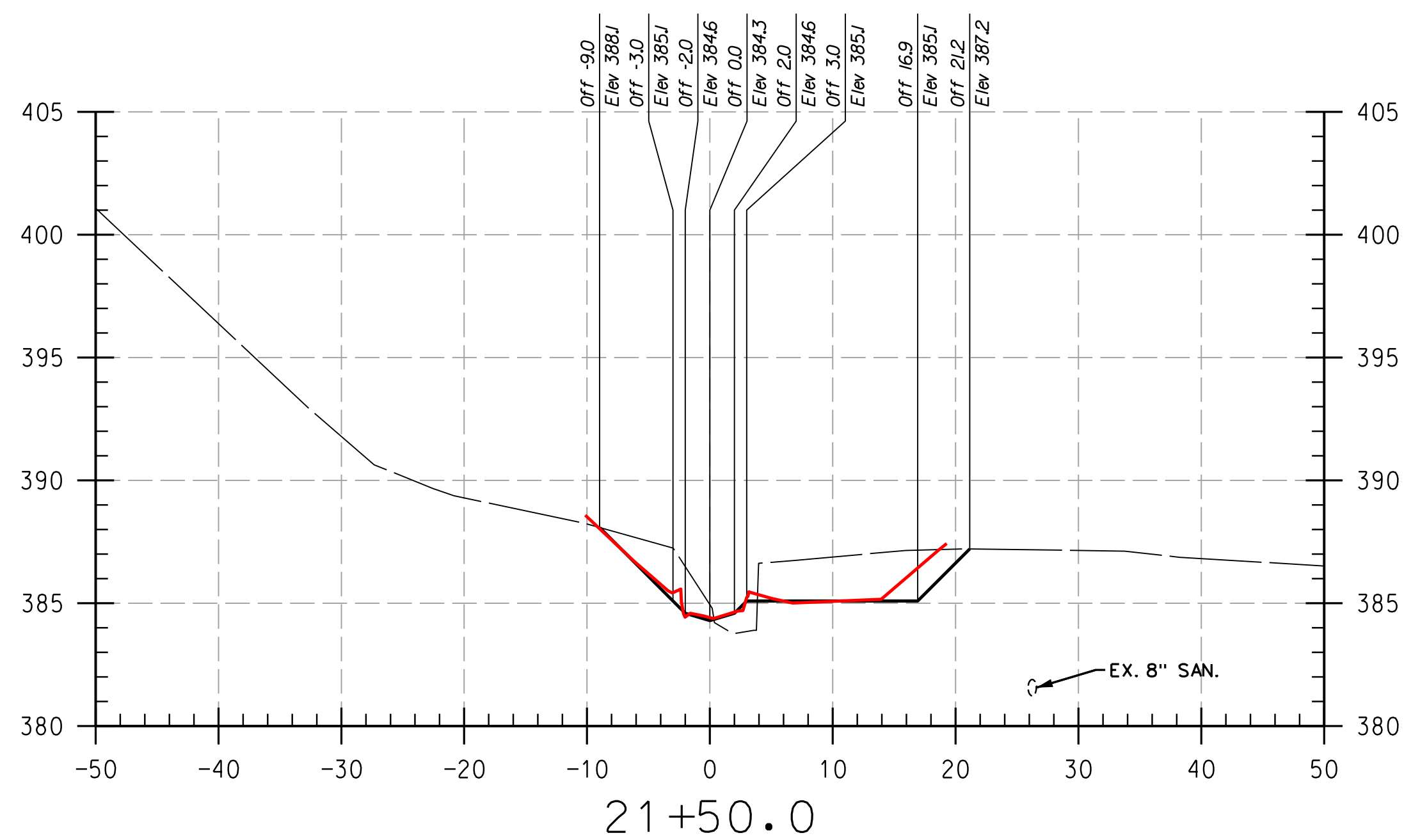
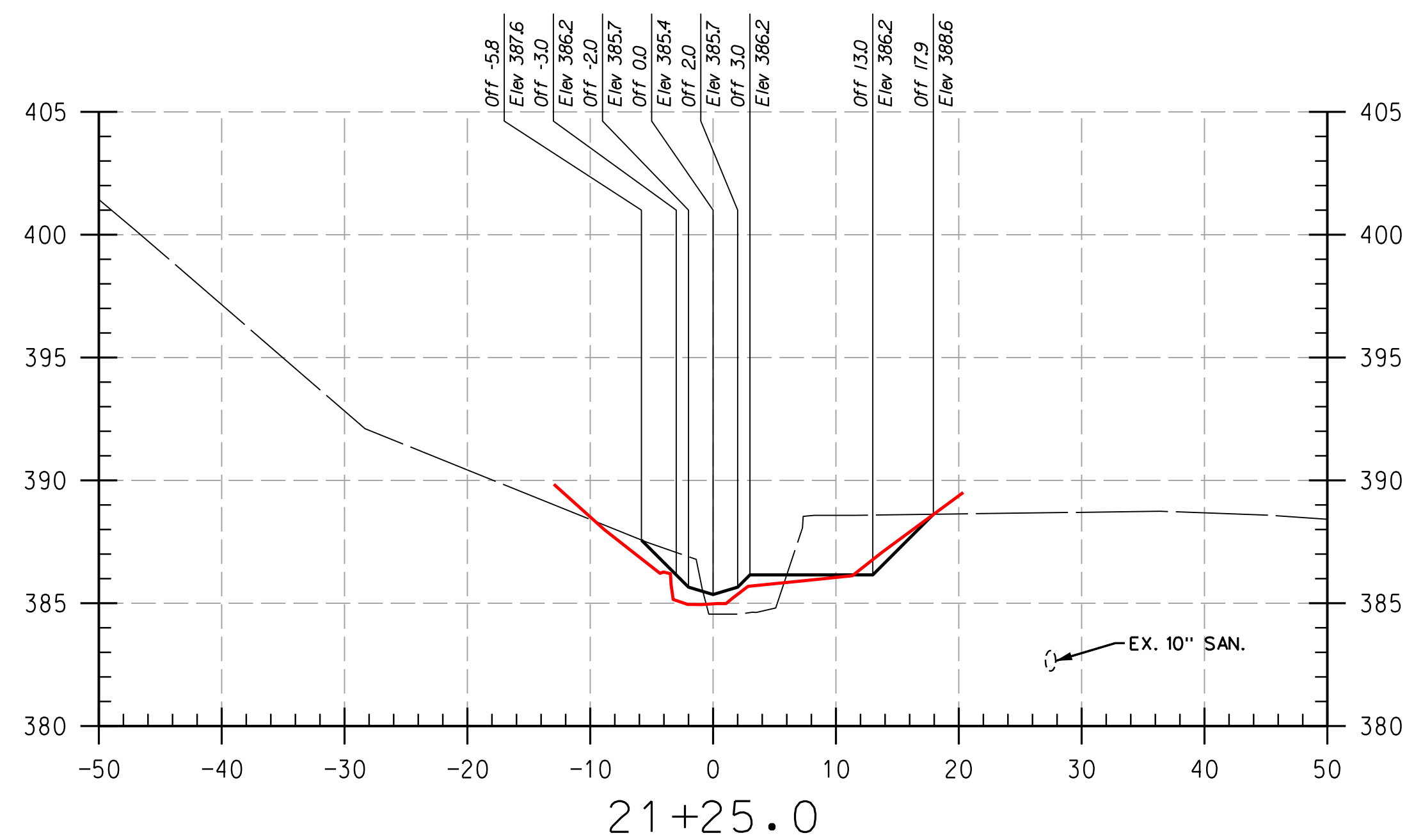
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ZONING: POR, NT ELECTION DISTRICT 05 GRID/BLOCK 0006

AS-BUILT
CROSS
SECTIONS

SCALE:	HOR: 1" = 10'
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DATE:	APRIL 2017
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PLOTTED: 12:28 PM on Monday, April 24, 2017
BY: Division
FILE: C:\CAD\Drawings\Howard\CC\BXS-P001_Howard CC_As-Built.dgn

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REACH 3

LEGEND

EXISTING GRADE	—
PROPOSED GRADE	—
AS-BUILT GRADE	—

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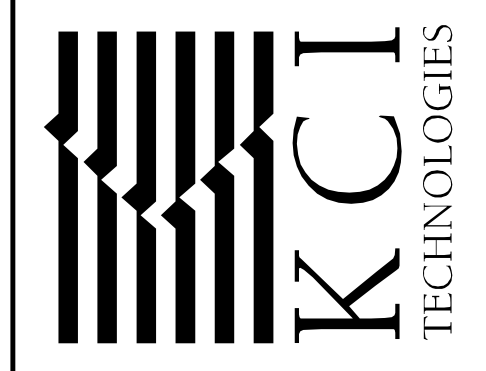
DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

HOWARD SCD _____ DATE _____

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES _____ DATE _____

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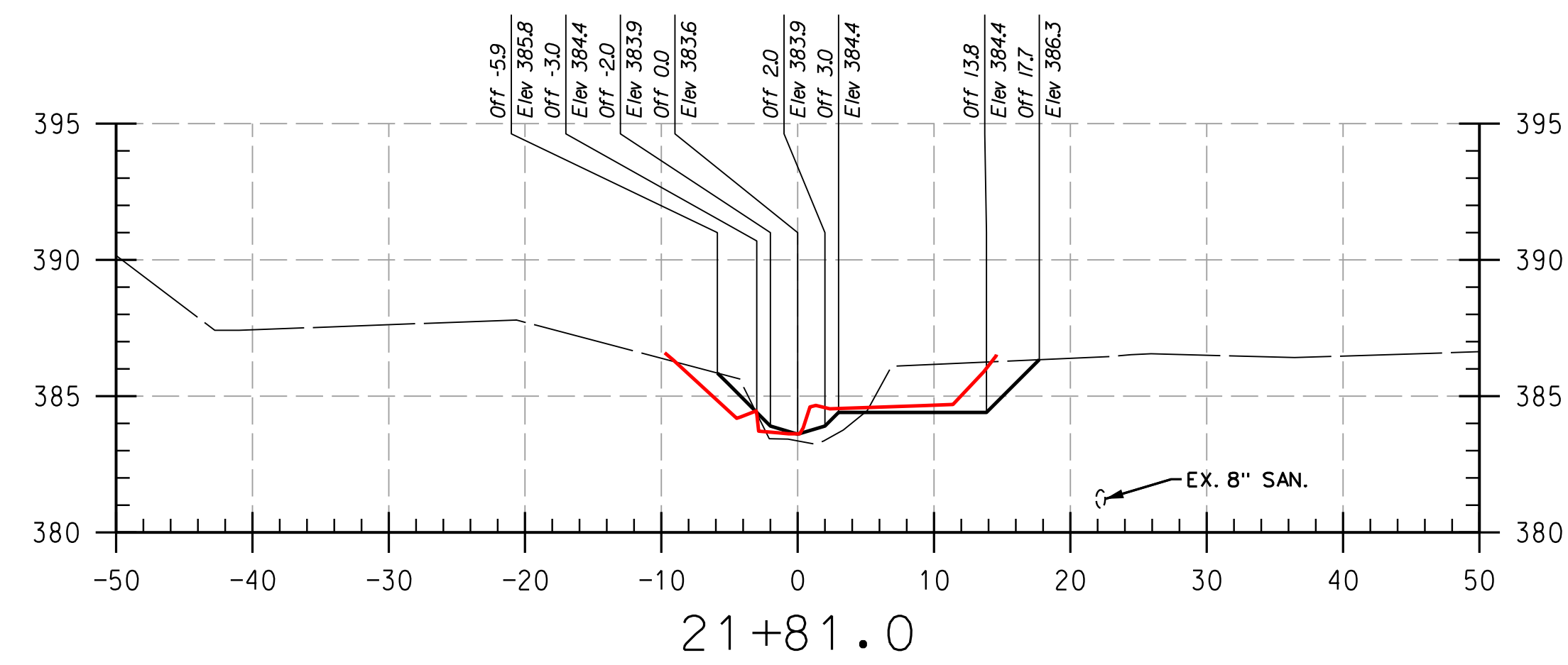
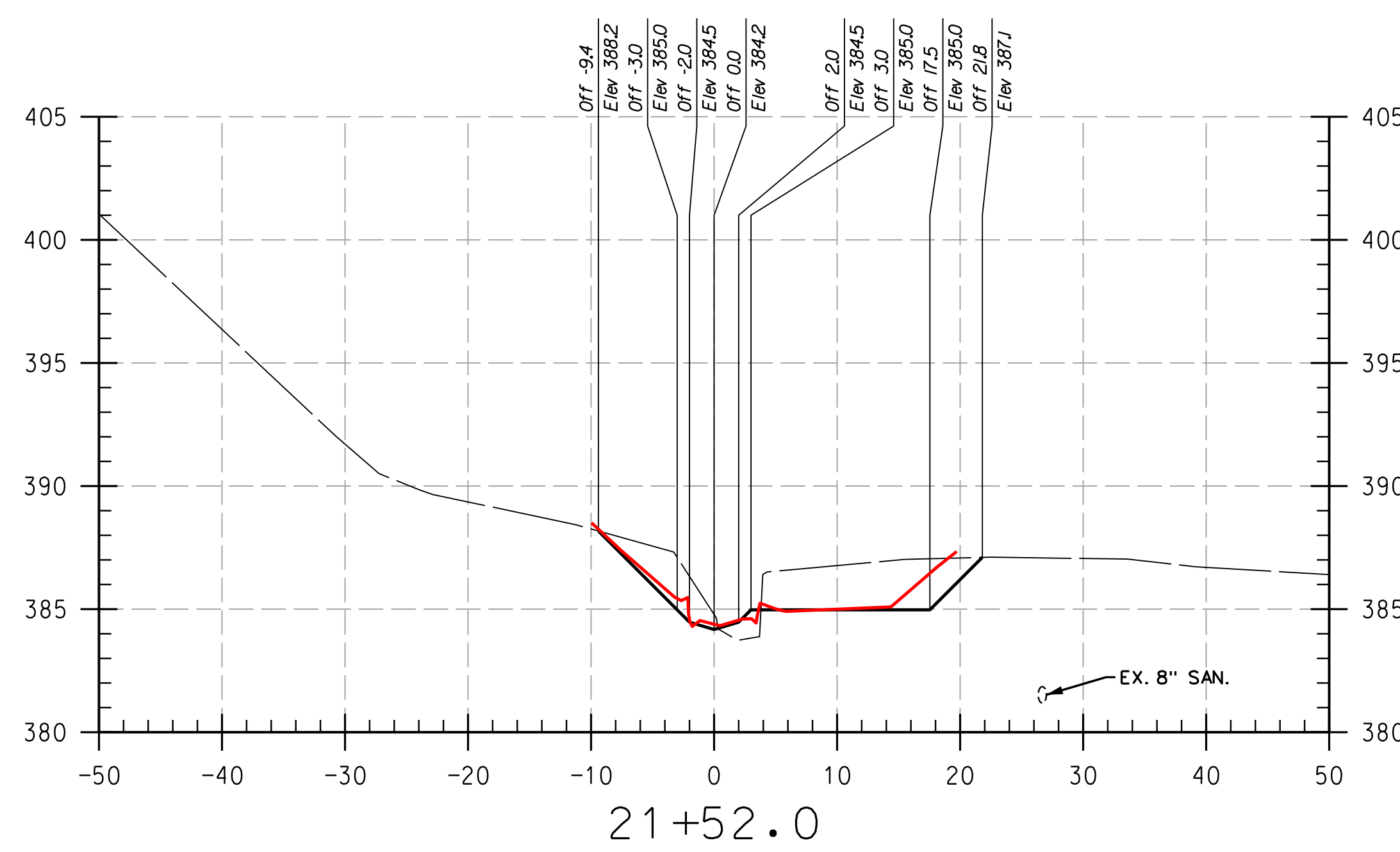
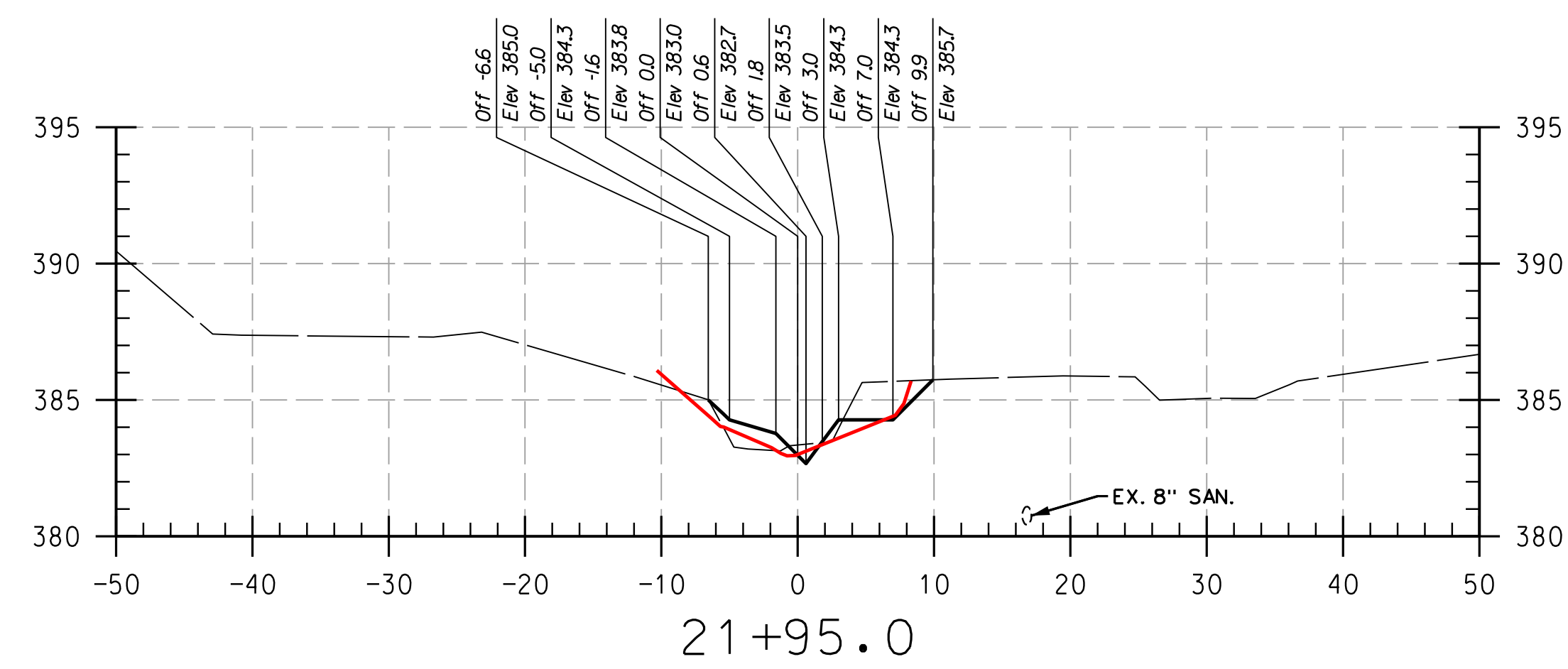
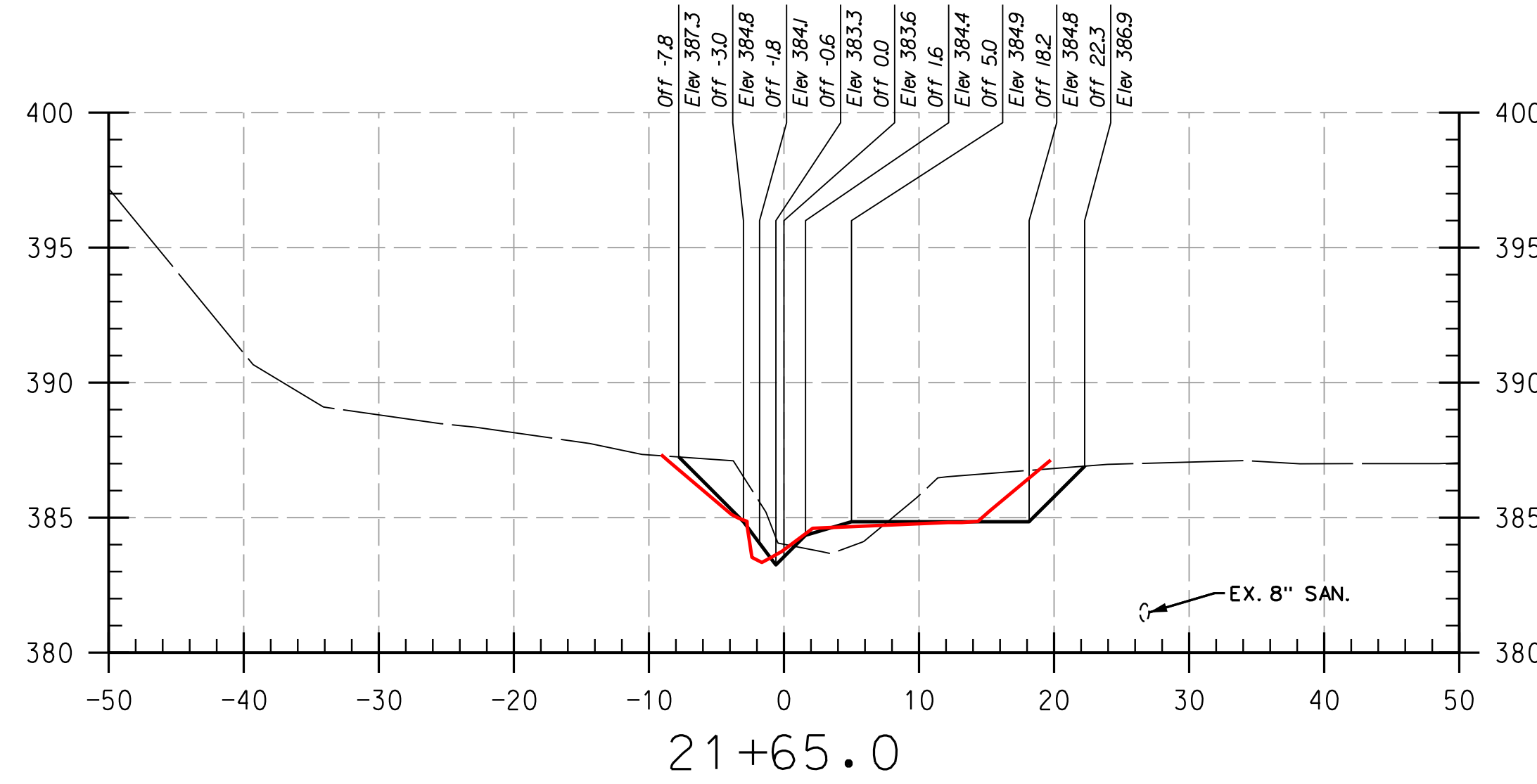
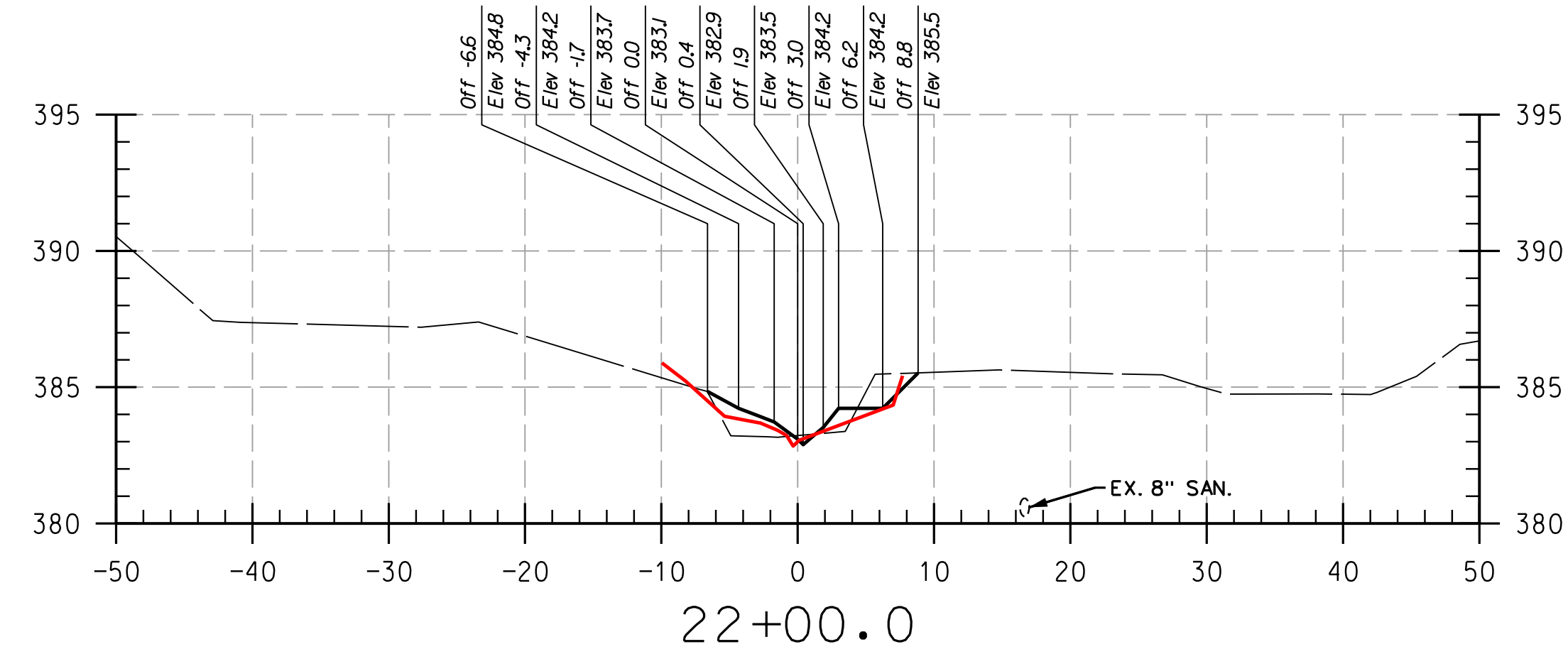
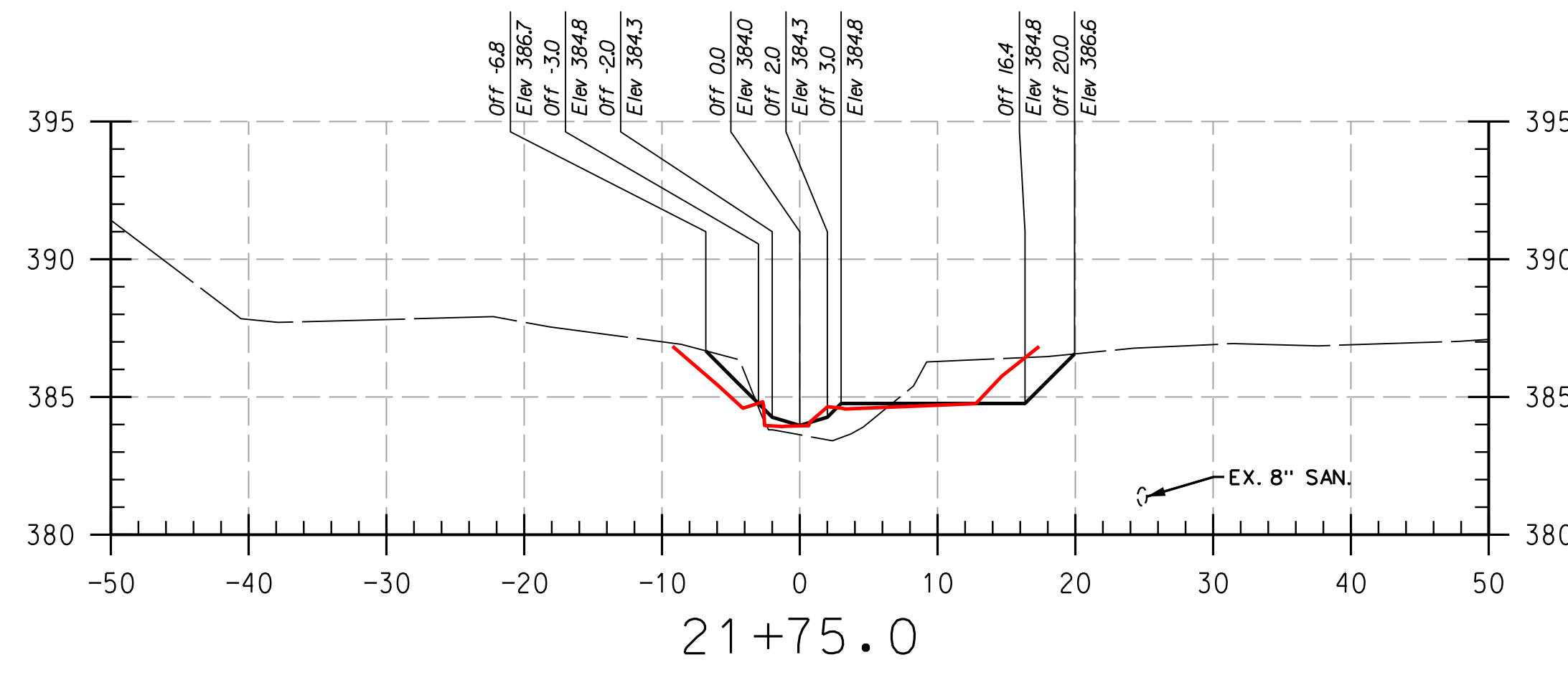


HOWARD COMMUNITY COLLEGE
STREAM RESTORATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
PARCELS 47, 81 TAX MAP 35.36
ZONING: POR, NT ELECTION DISTRICT 05 GRIDBLOCK 0006

AS-BUILT CROSS SECTIONS

SCALE:	HOR: 1" = 10'
	VERT: 1" = 5'
DATE:	APRIL 2017
KCI JOB NO.:	17133314.83
CAPITAL PROJECT NO.:	D-1158
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

PLOTTED: 12:28 PM on Monday, April 24, 2017
 BY: Division
 FILE: C:\CAD\Drawings\Howard CC\PS-P001_Howard CC_As-Built.dgn



REACH 3

LEGEND	
EXISTING GRADE	---
PROPOSED GRADE	---
AS-BUILT GRADE	---

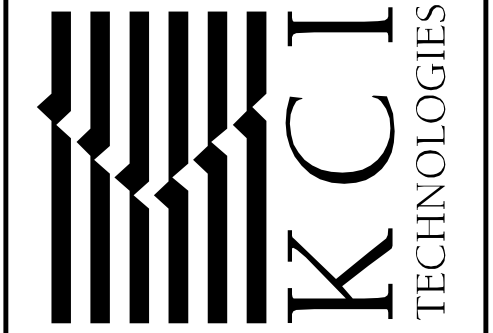
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EXCAVATING NEAR ANY UTILITIES. TEST PIT IF REQUIRED.

PROFESSIONAL CERTIFICATION. I HEREBY
CERTIFY THAT THESE DOCUMENTS WERE
PREPARED OR APPROVED BY ME, AND THAT
I AM A DULY LICENSED PROFESSIONAL
ENGINEER UNDER THE LAWS OF THE STATE
OF MARYLAND, LICENSE NO. 38311,
EXPIRATION DATE: JANUARY 06, 2018

HOWARD SCD	DATE	DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD	DATE
		CHIEF, BUREAU OF ENVIRONMENTAL SERVICES	

NO.	REVISIONS DESCRIPTION	DATE

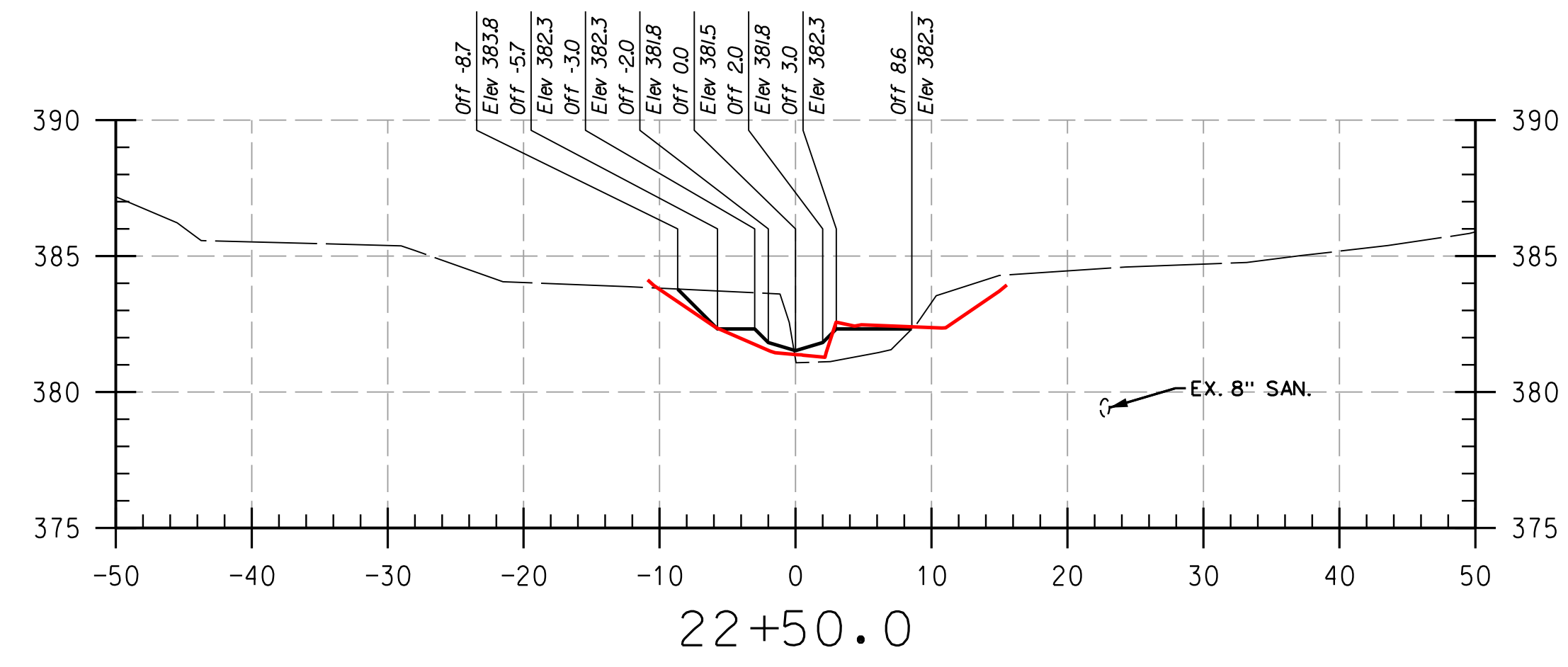
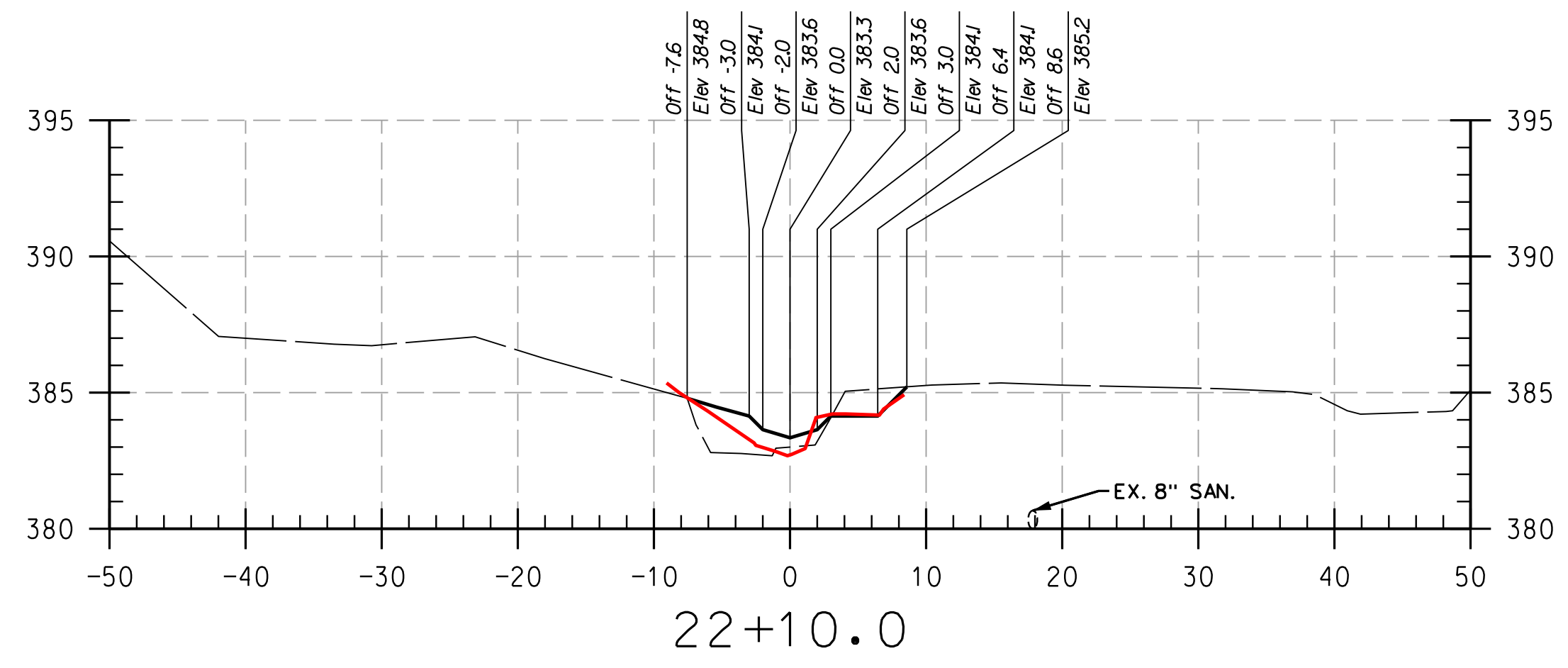
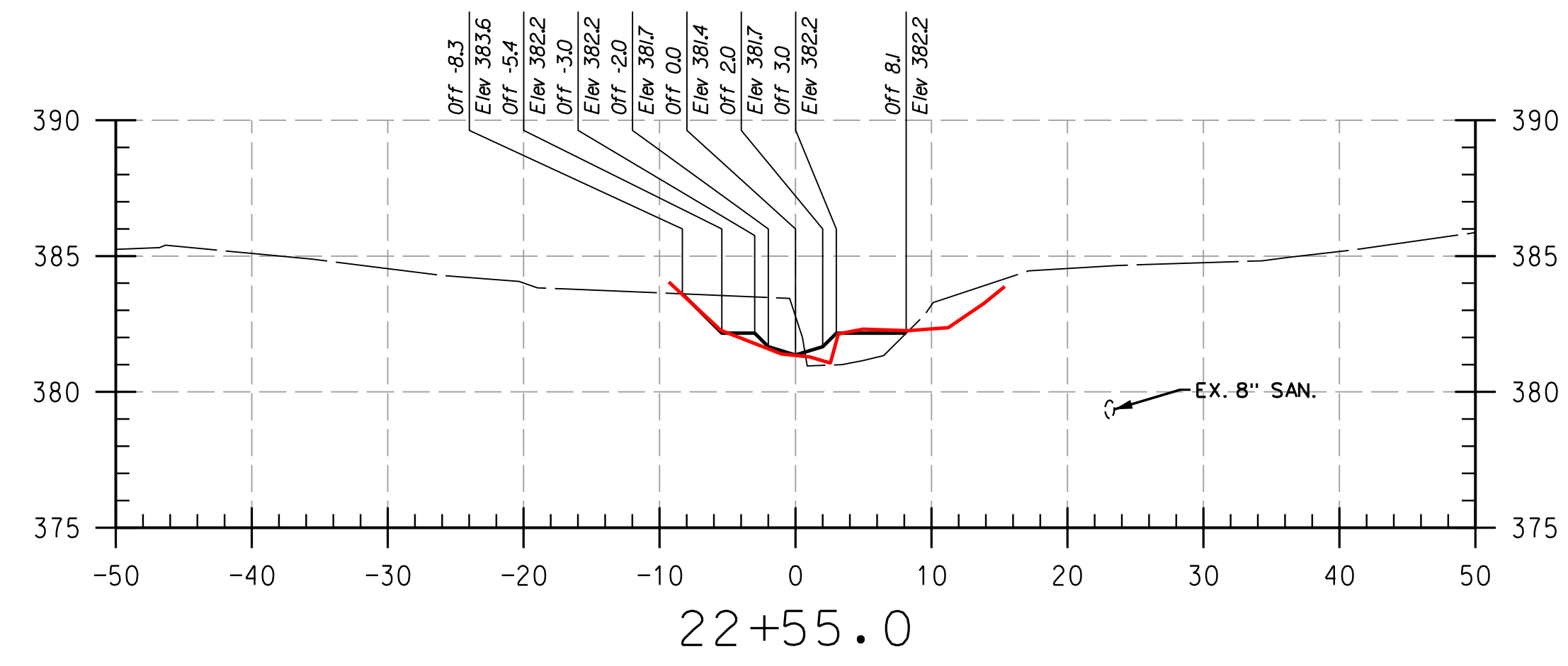
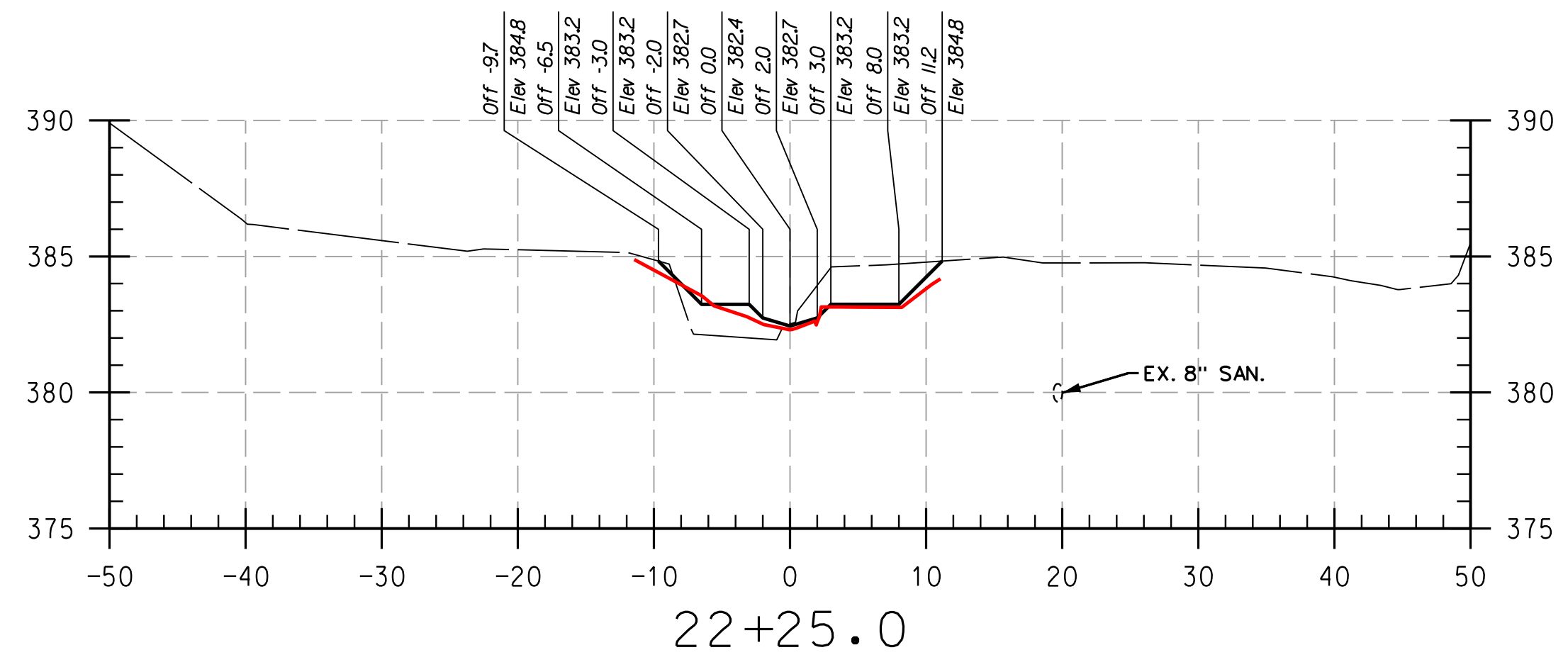
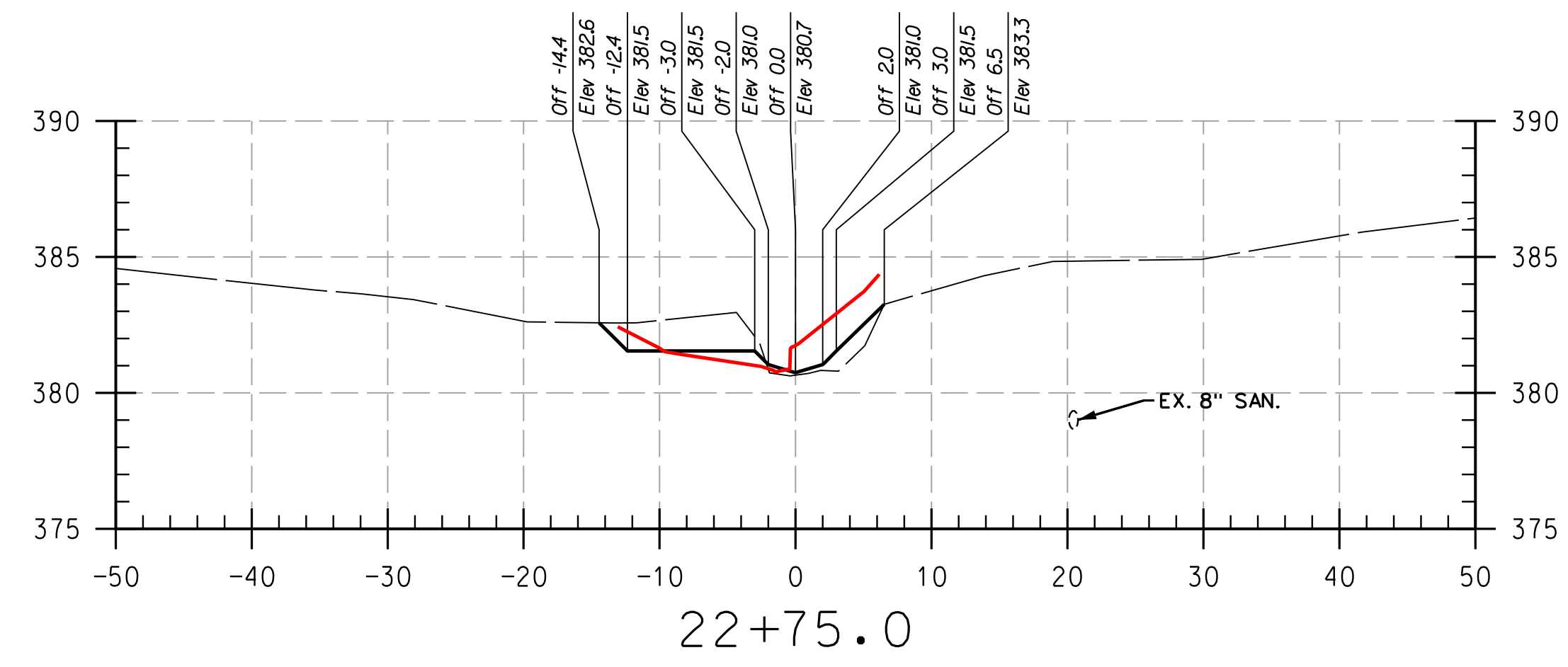
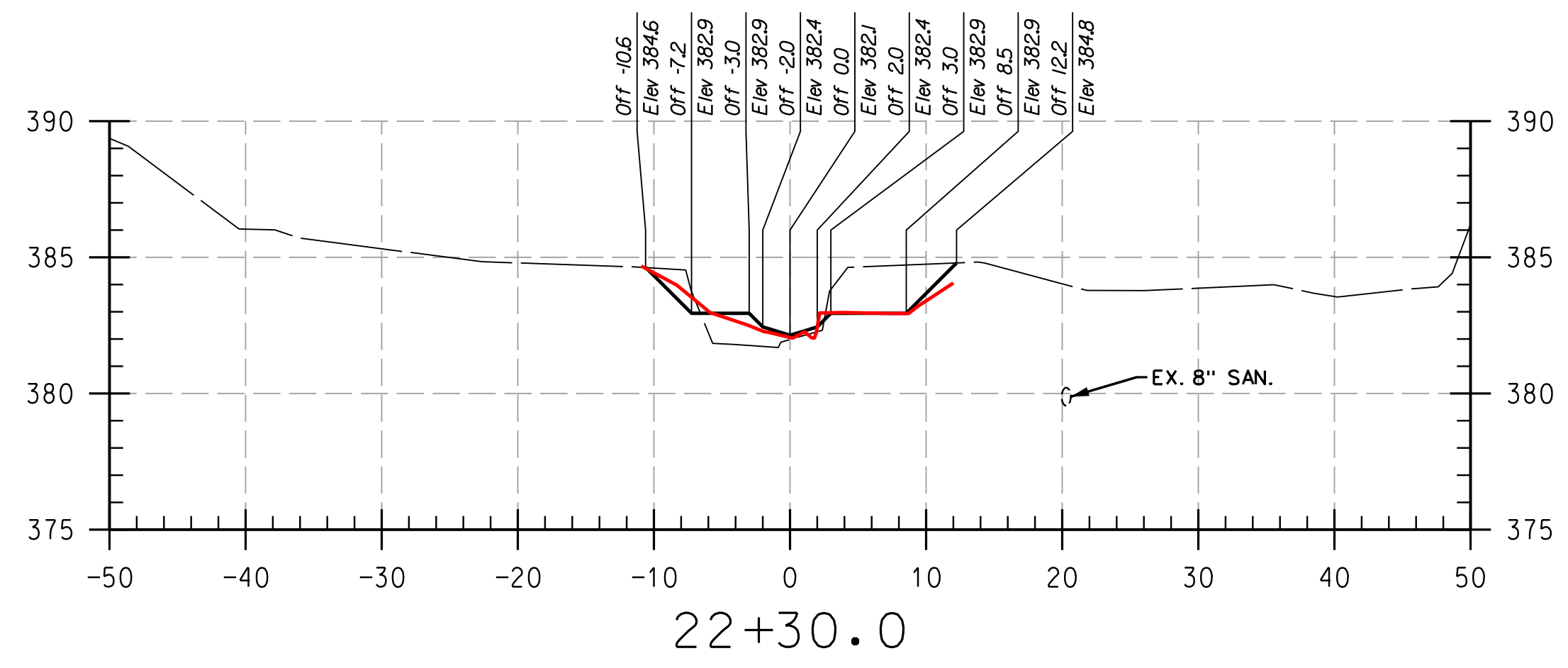
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HOWARD COMMUNITY COLLEGE
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CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT DIVISION
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COLUMBIA, MD 21046
PARCELS 47, 81 TAX MAP 35.36
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AS-BUILT CROSS SECTIONS

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PERMIT ISSUE:	
CONSTRUCTION ISSUE:	



REACH 3

LEGEND

EXISTING GRADE	---
PROPOSED GRADE	---
AS-BUILT GRADE	---

NOTE:
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THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD _____ DATE _____

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES _____ DATE _____

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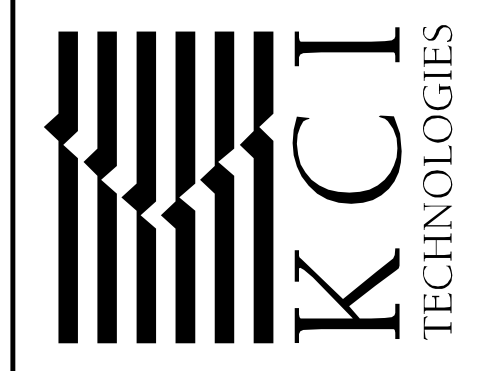
BY: Division: _____

FILE: C:\CAD\Drawings\Howard\CC\22S-P001-Howard CC As-Built.dgn

PLOTTED: 11:28 PM on Monday, April 24, 2017

NO.	REVISIONS DESCRIPTION	DATE

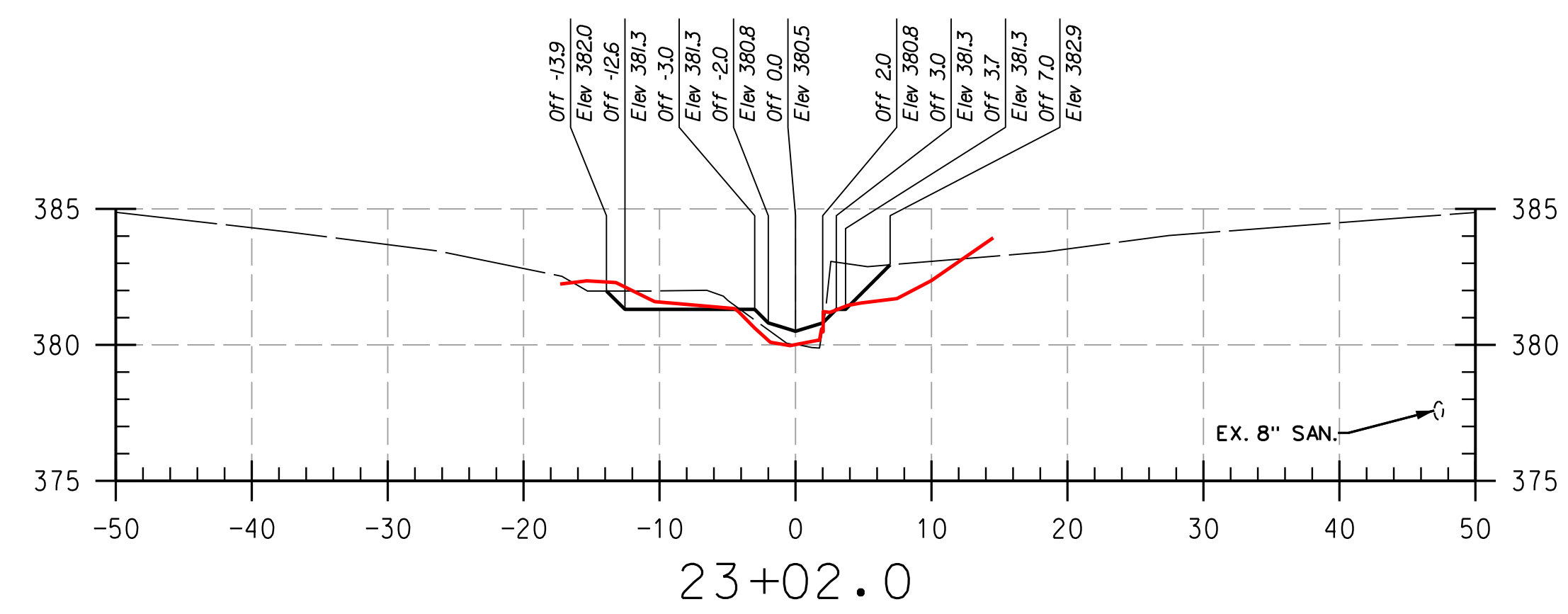
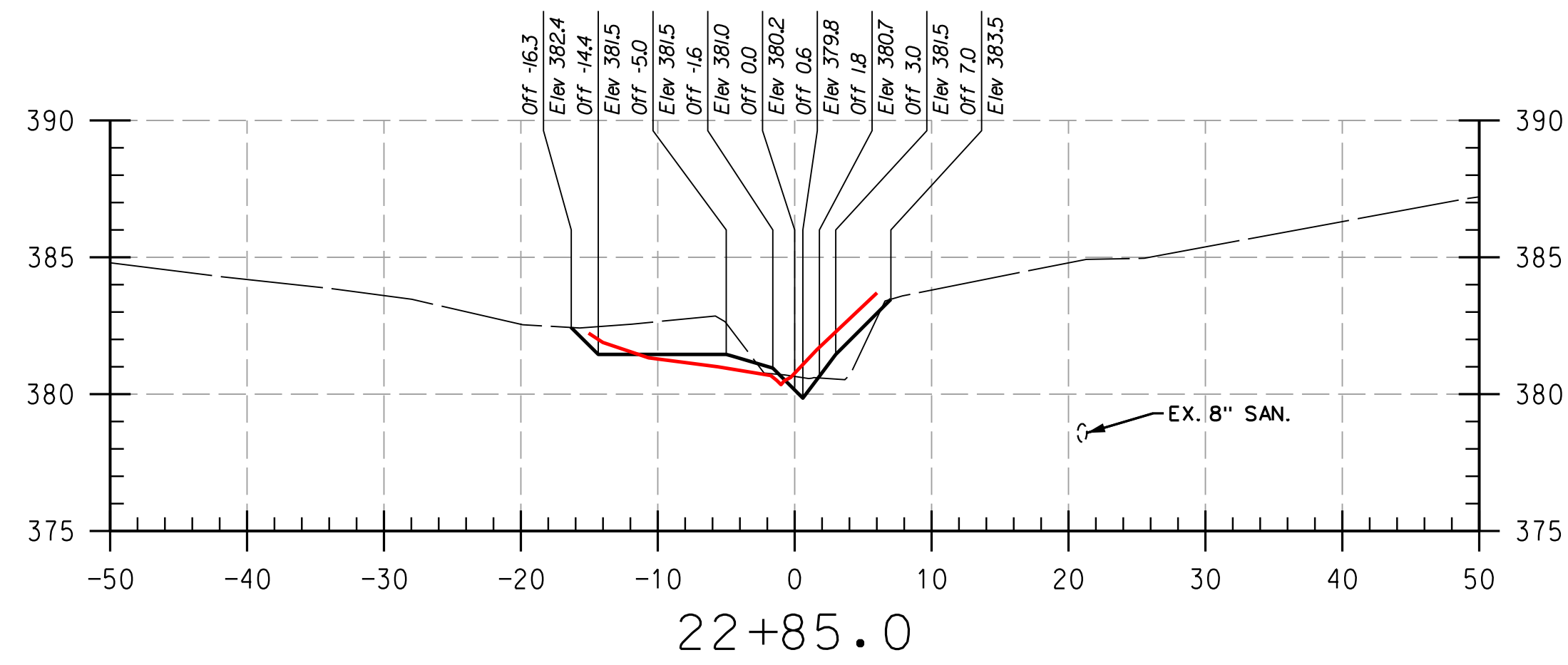
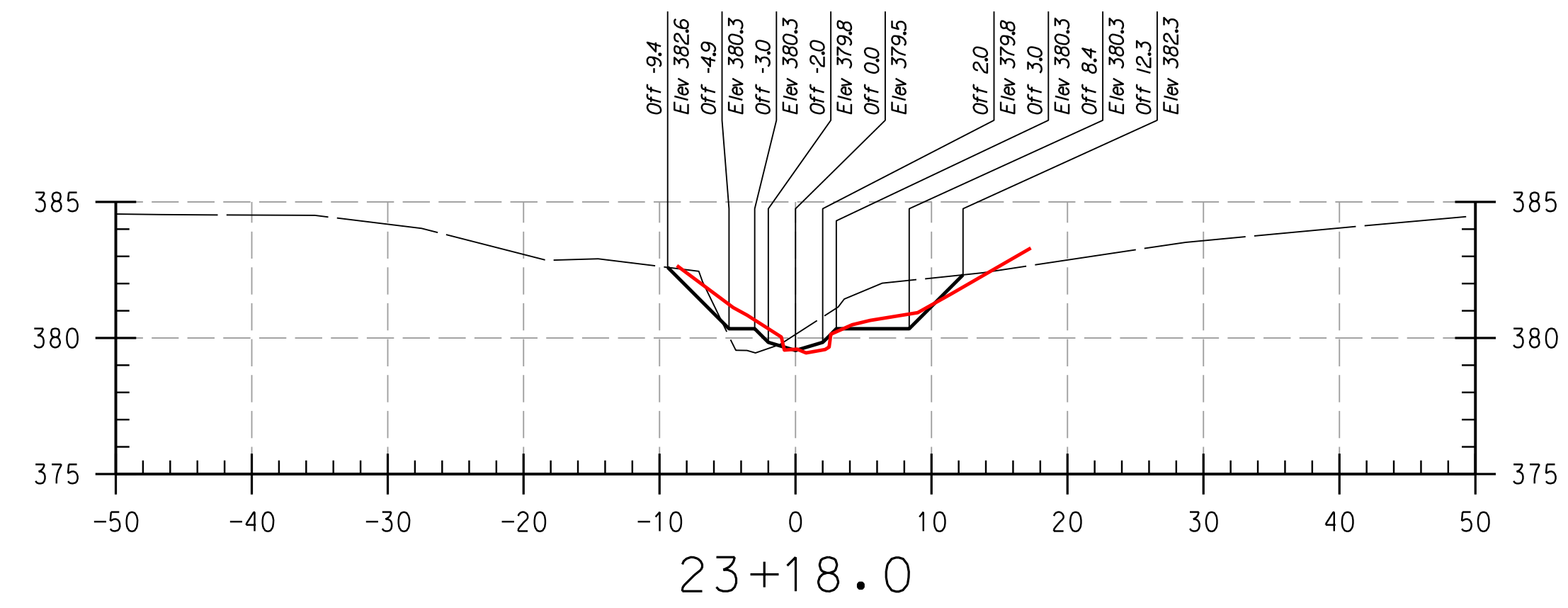
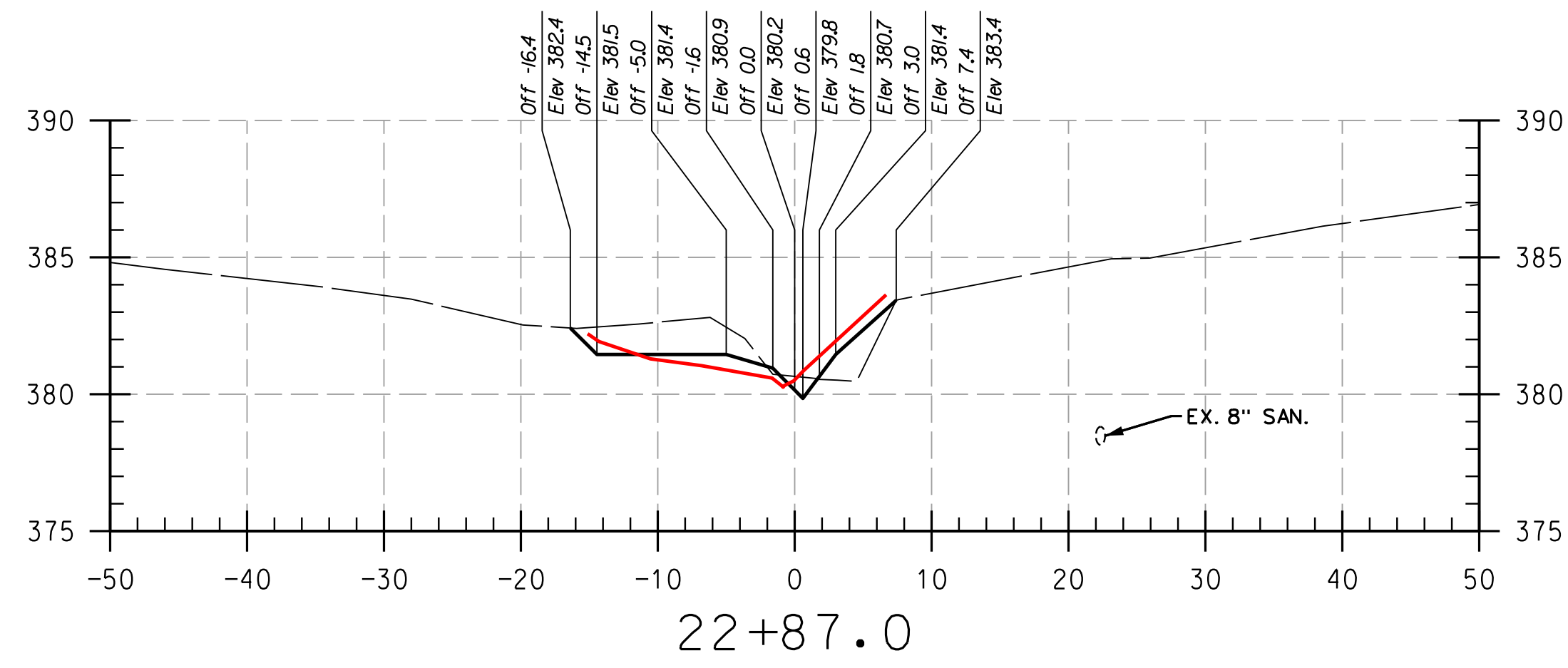
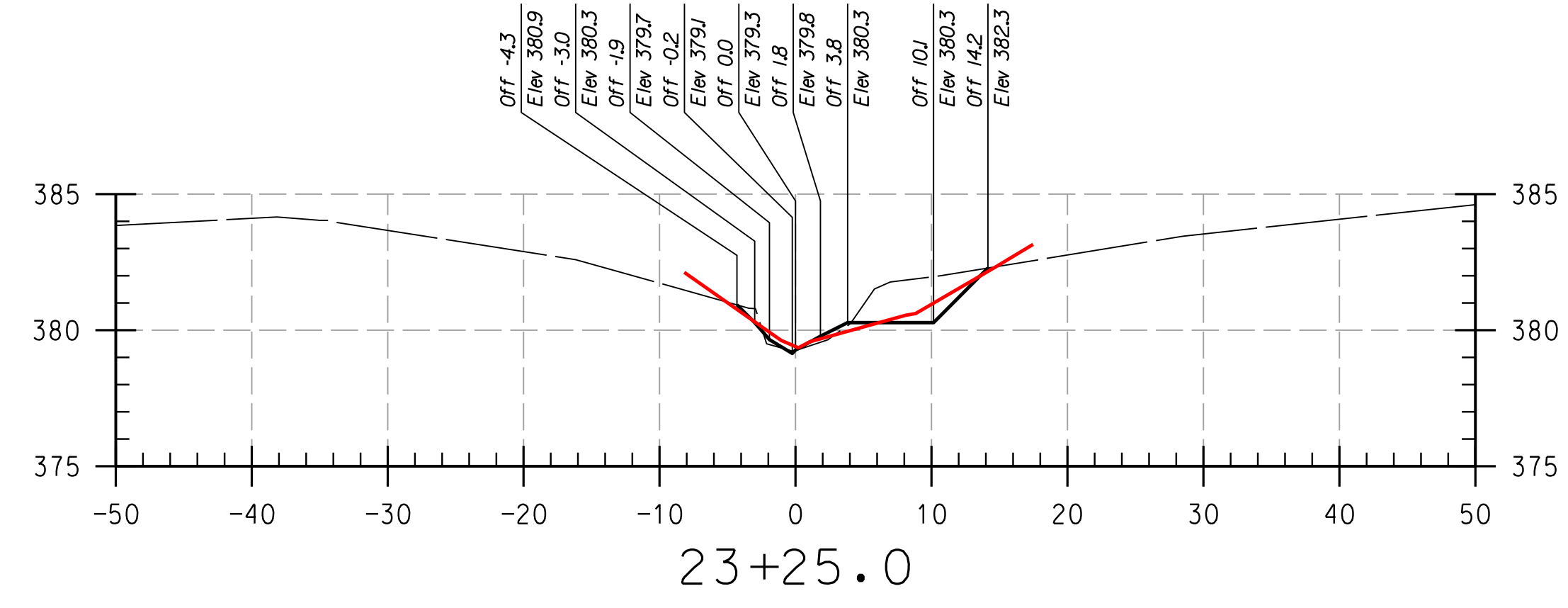
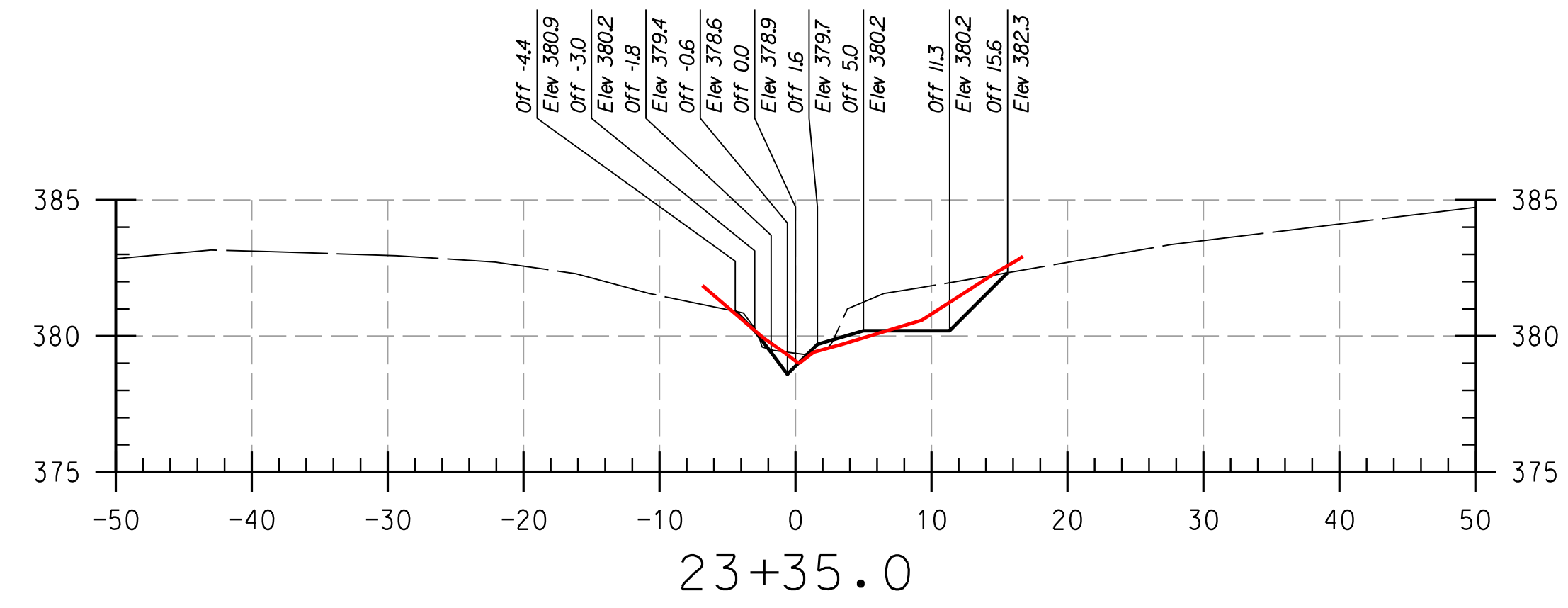
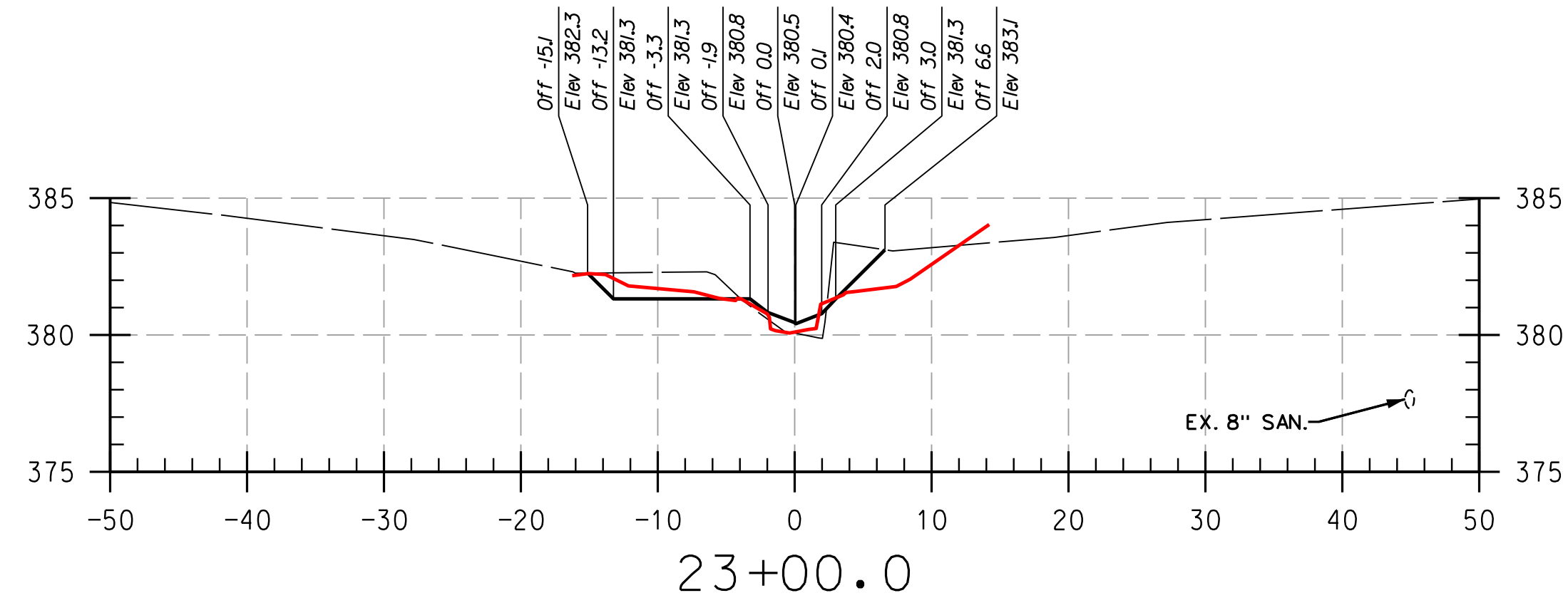
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AS-BUILT CROSS SECTIONS

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CONSTRUCTION ISSUE:	



REACH 3

LEGEND

EXISTING GRADE	---
PROPOSED GRADE	---
AS-BUILT GRADE	---

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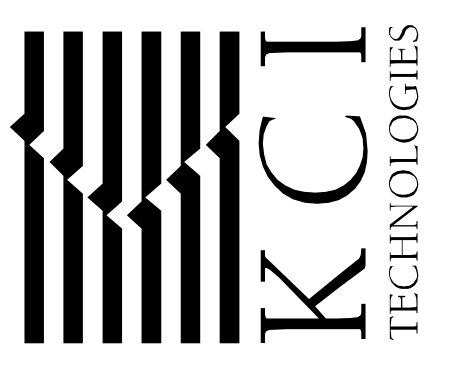
HOWARD SCD _____ DATE _____

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES _____ DATE _____

NO.	REVISIONS DESCRIPTION	DATE

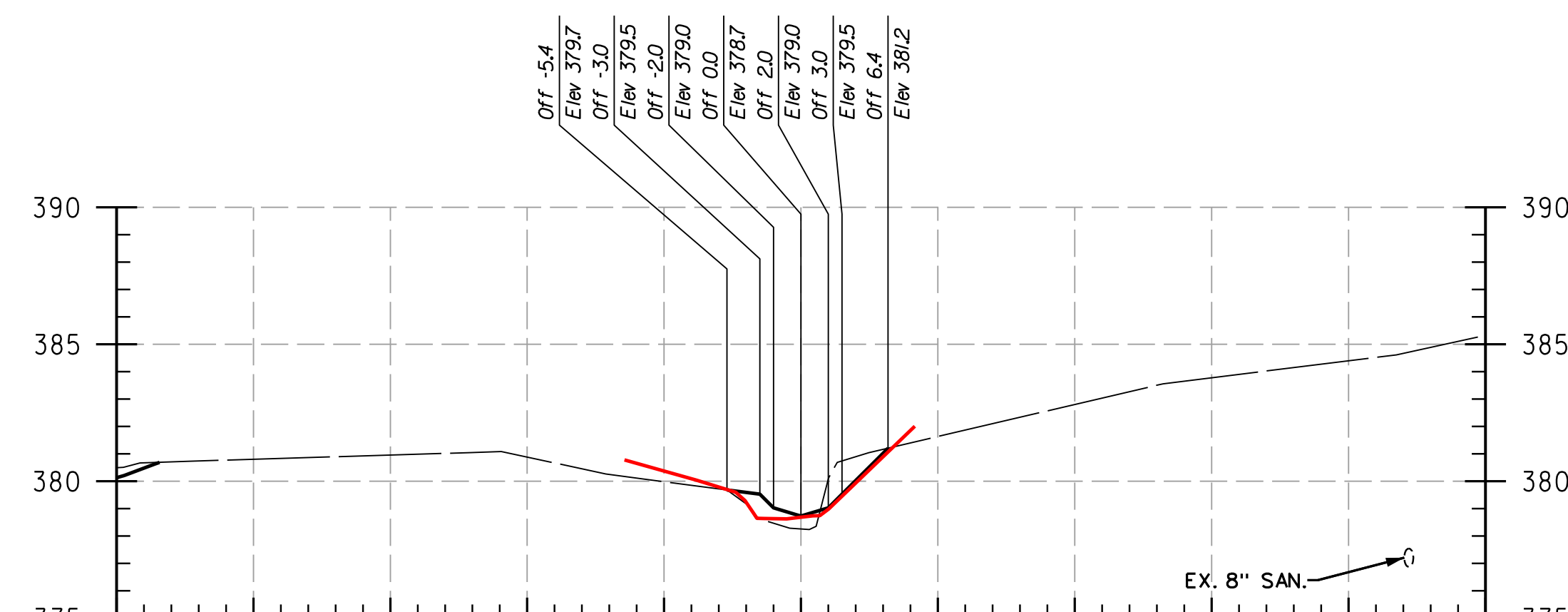
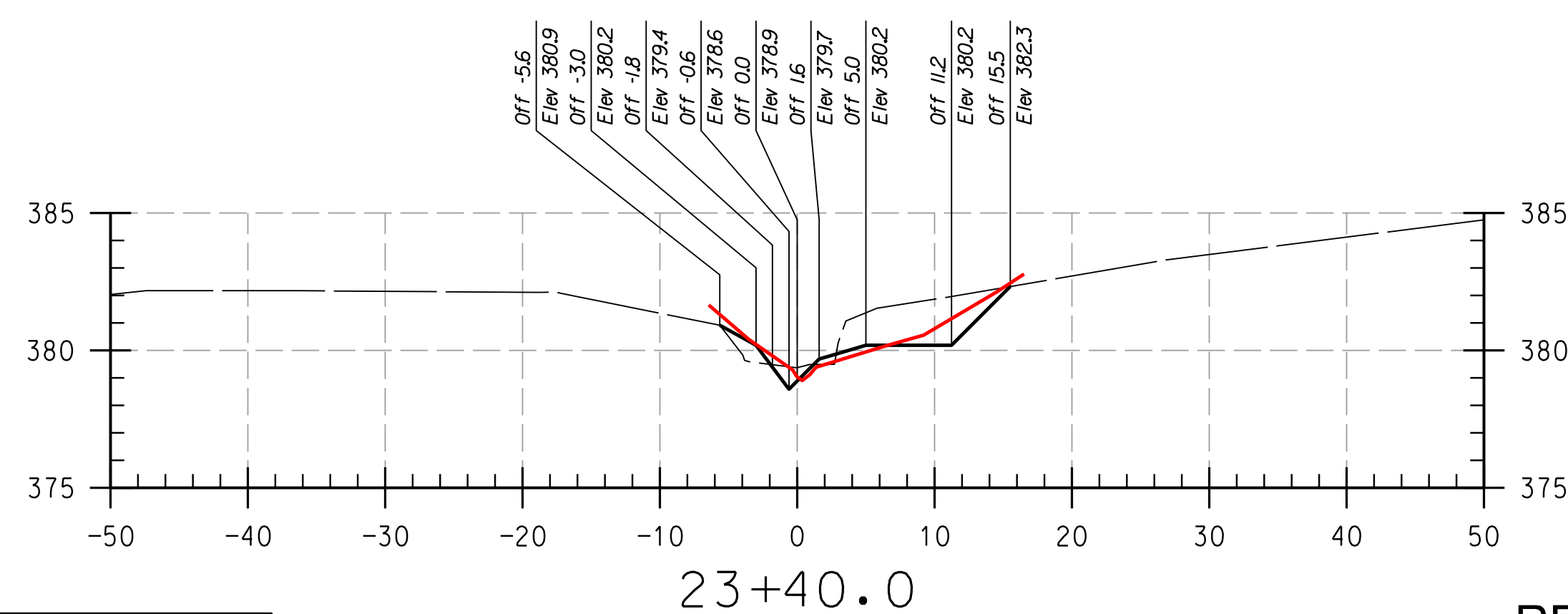
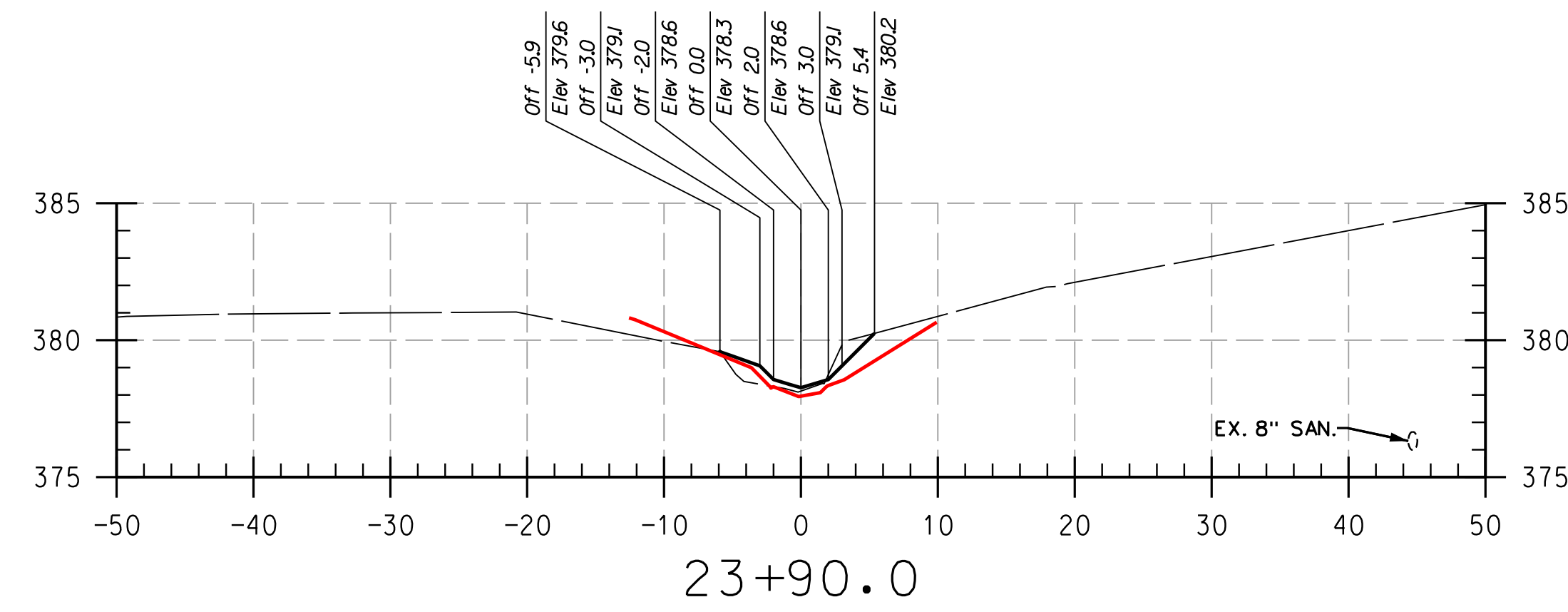
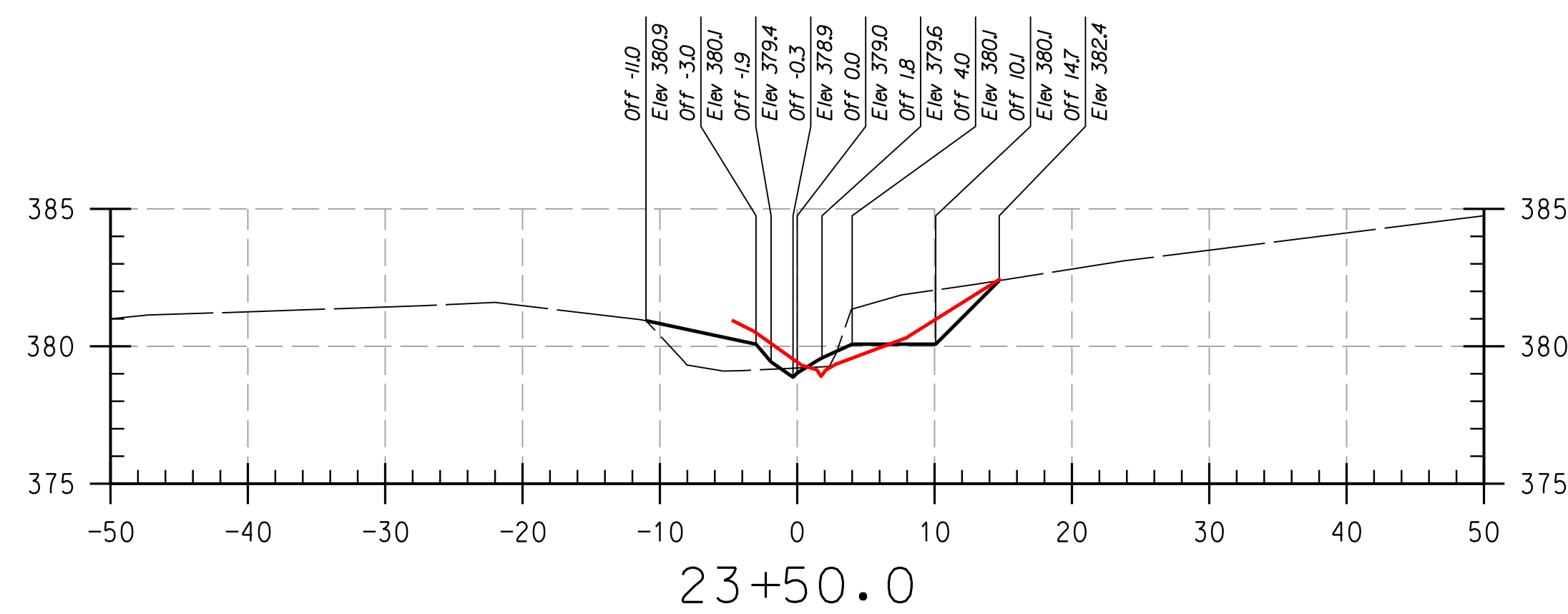
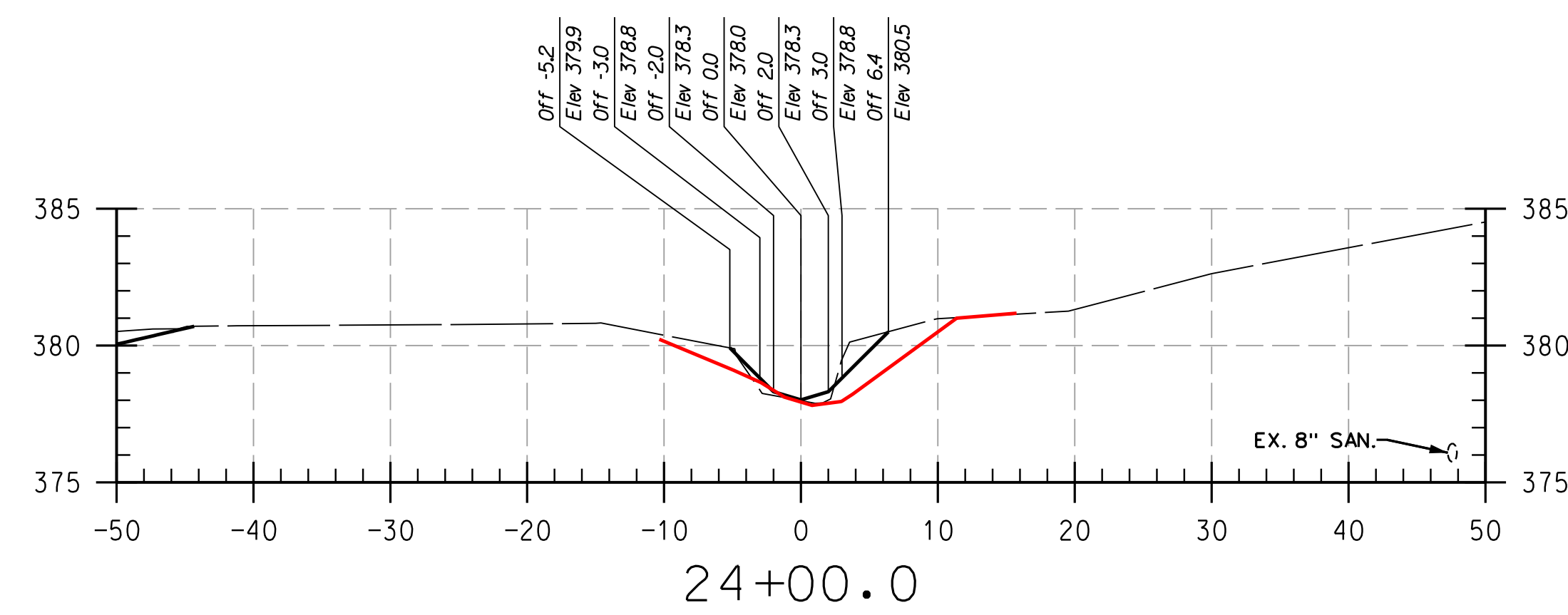
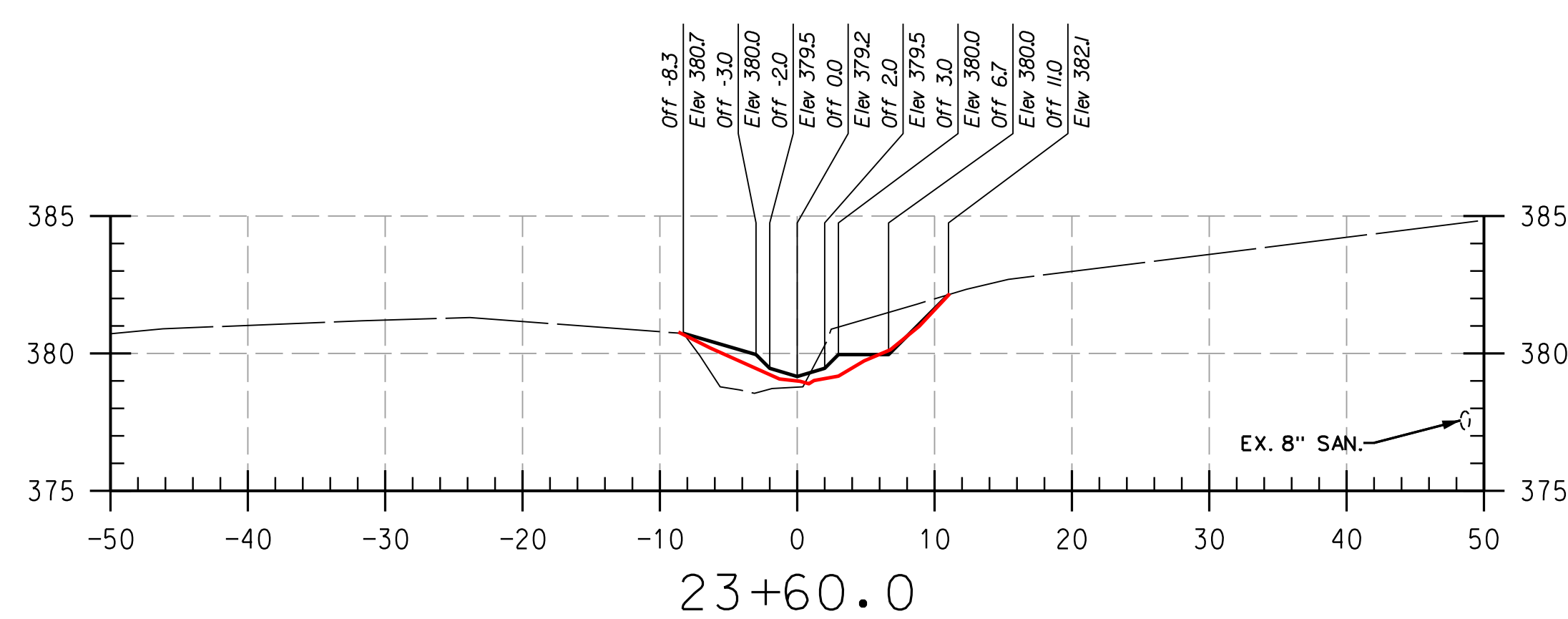
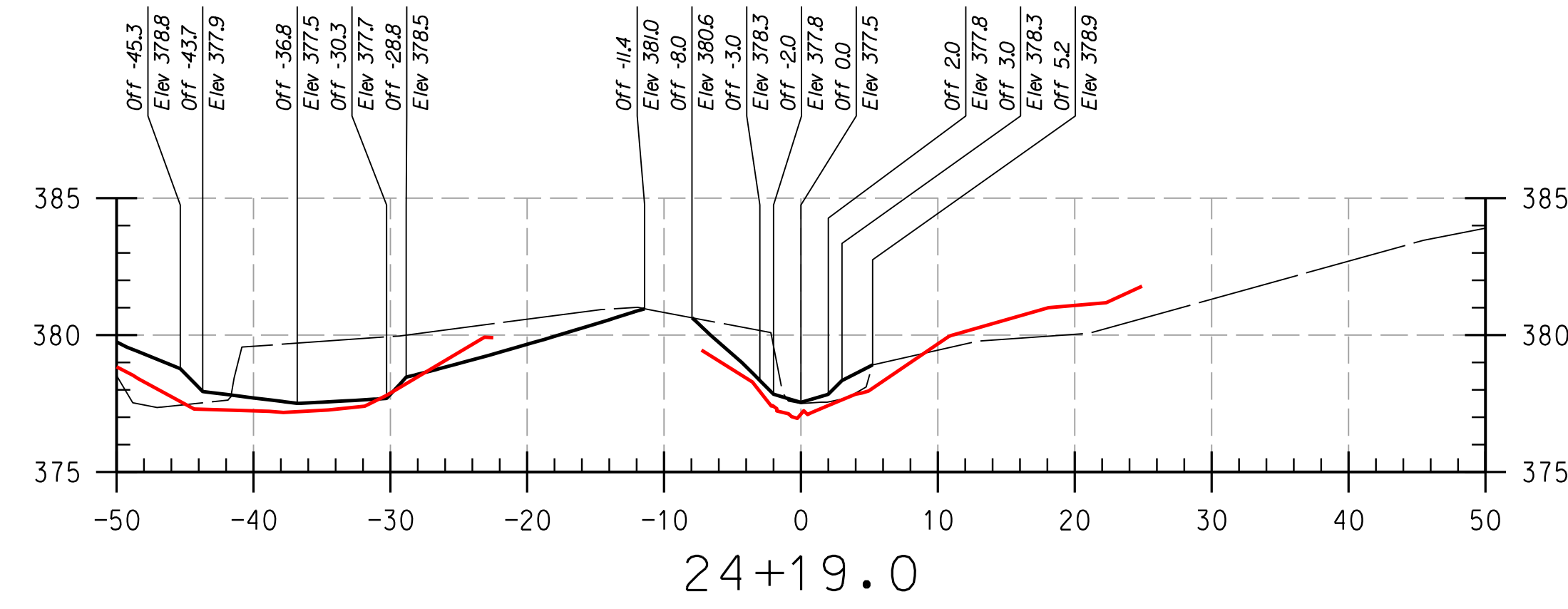
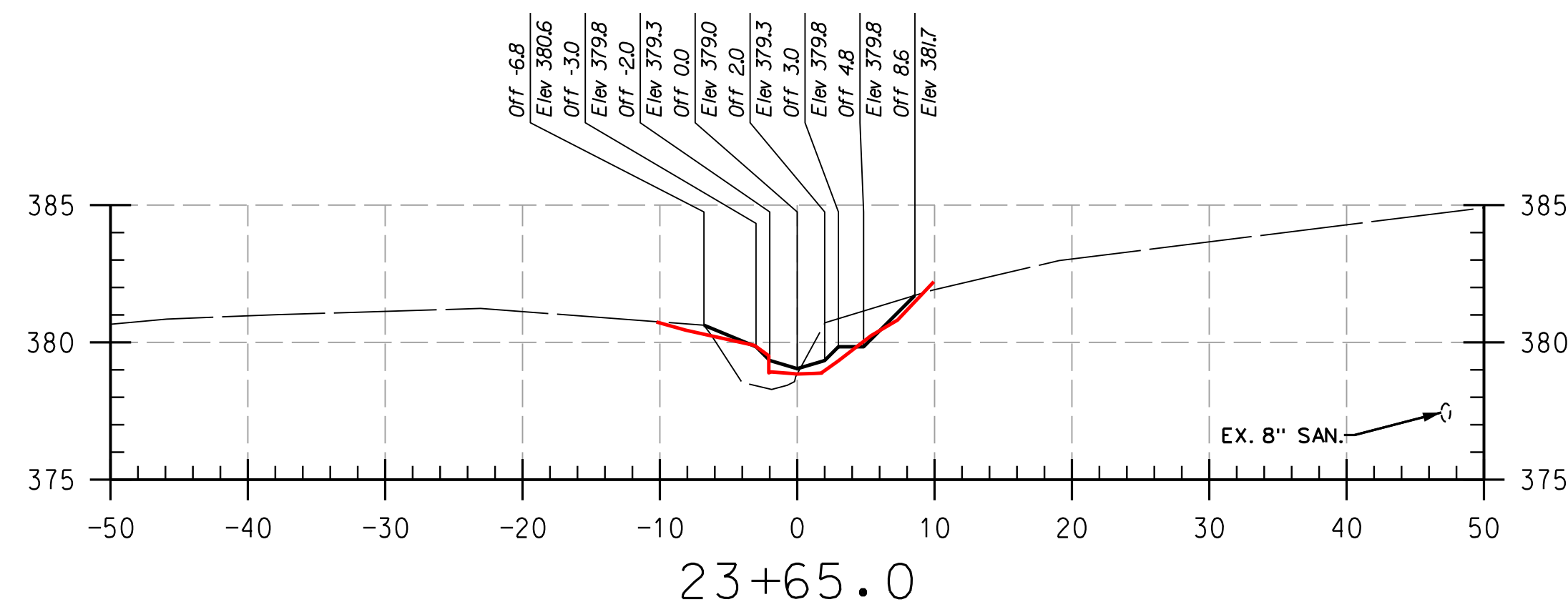
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SECTIONS

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REACH 3

LEGEND

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PROPOSED GRADE	---
AS-BUILT GRADE	---

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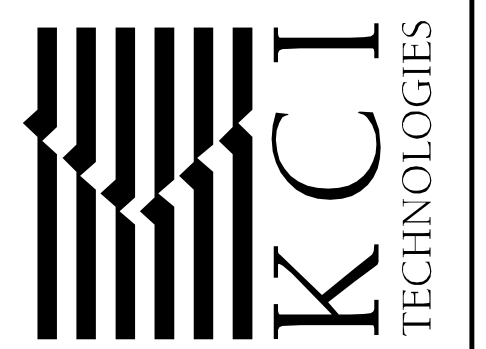
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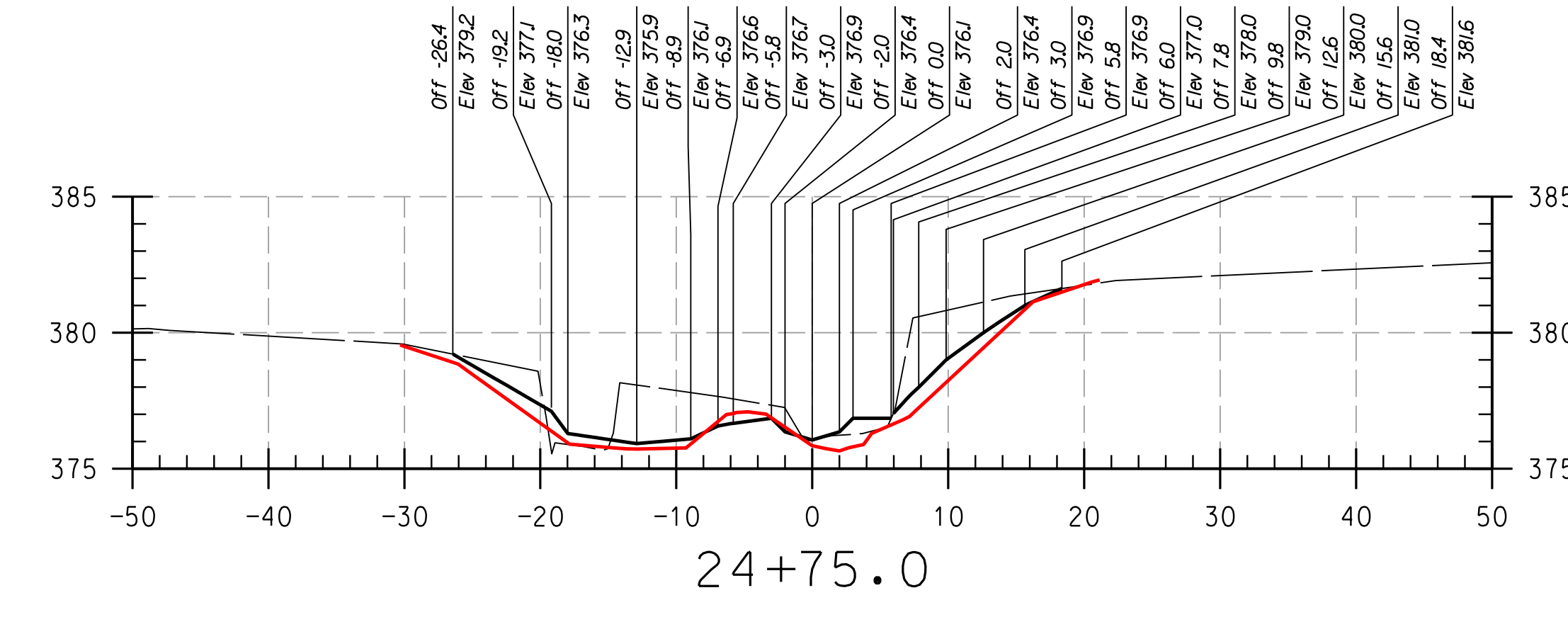
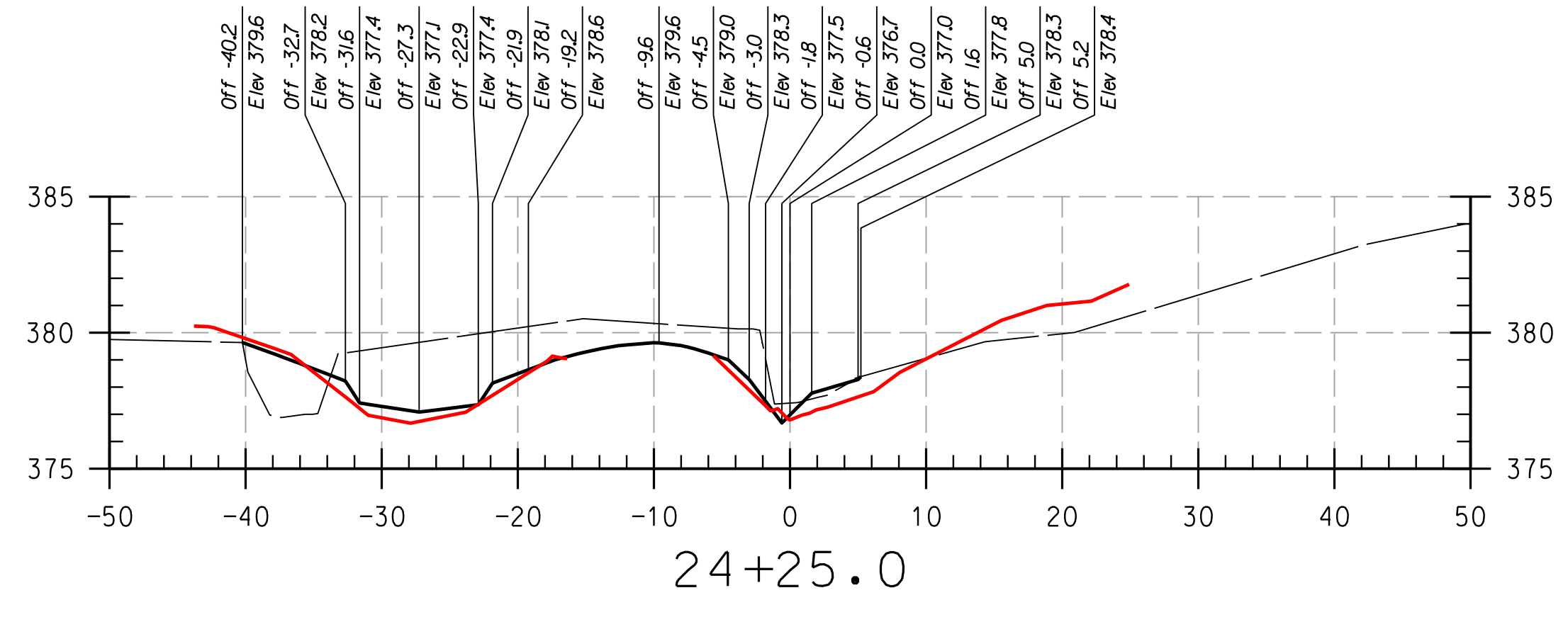
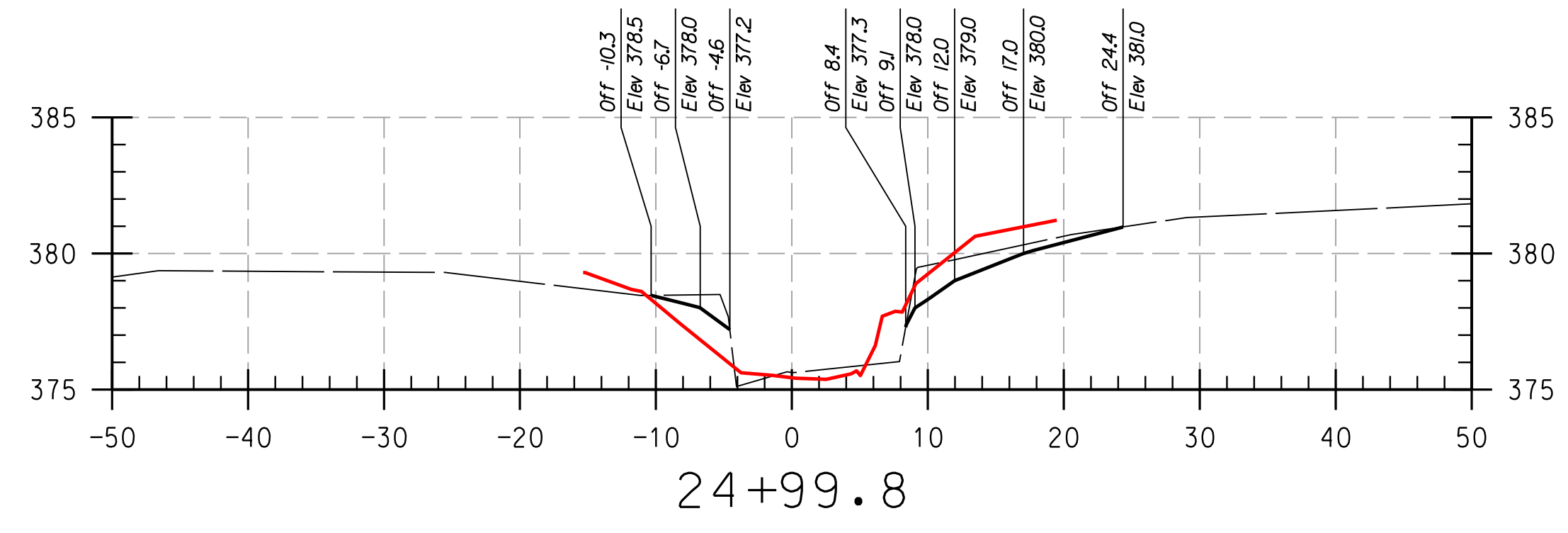
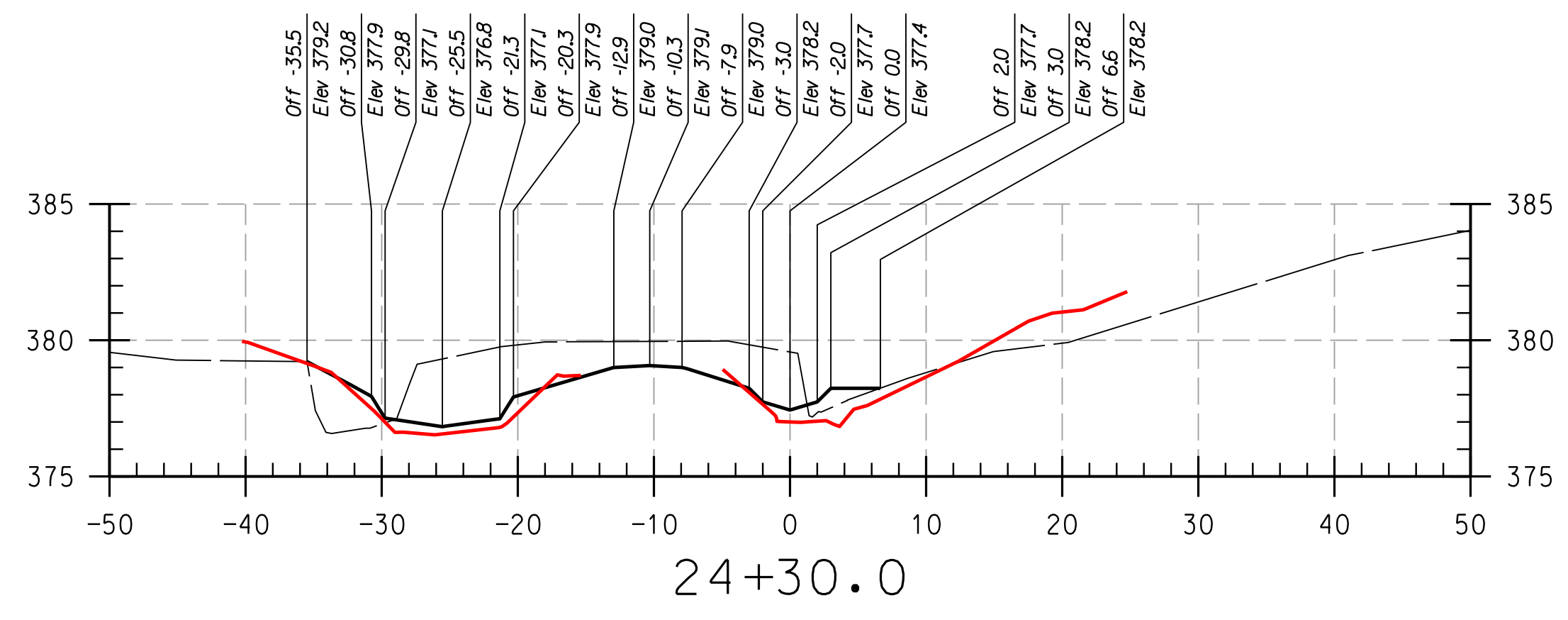
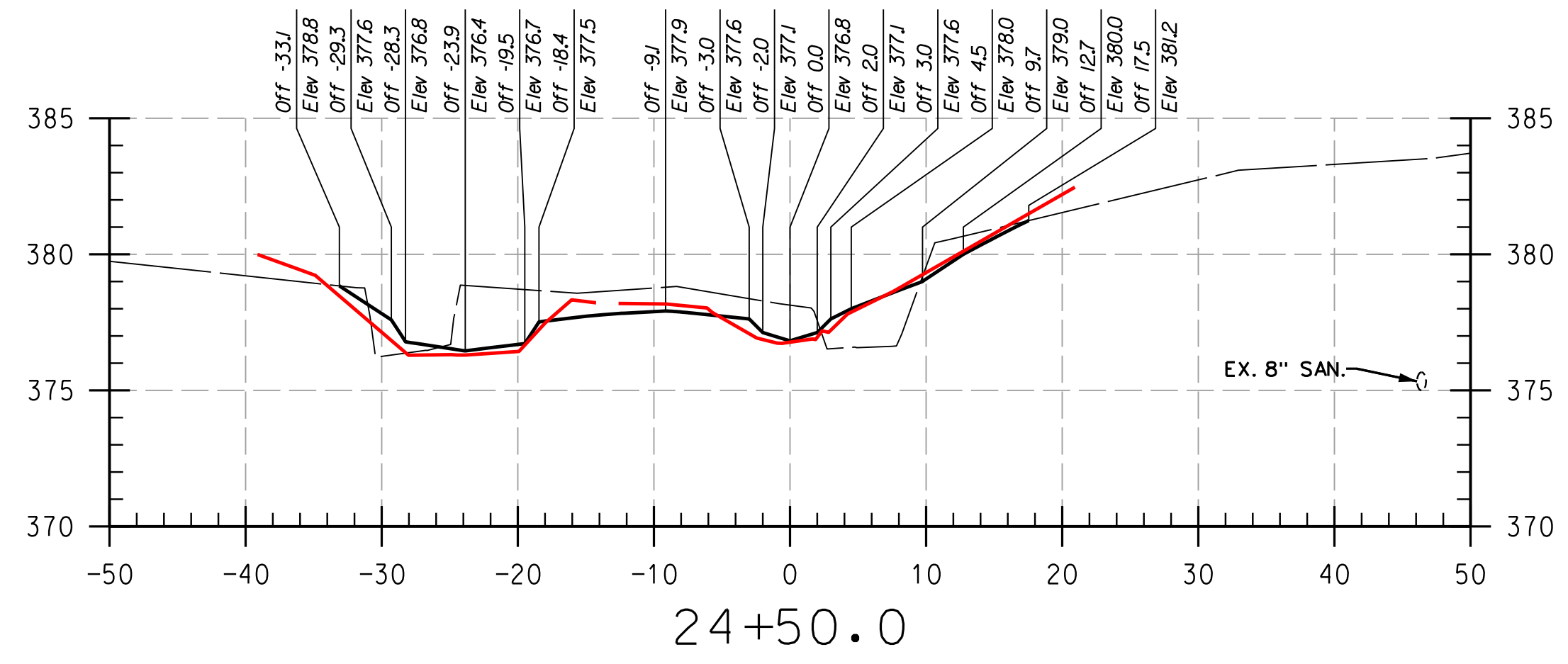
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AS-BUILT
CROSS
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REACH 3

LEGEND

EXISTING GRADE _____

PROPOSED GRADE _____

AS-BUILT GRADE _____

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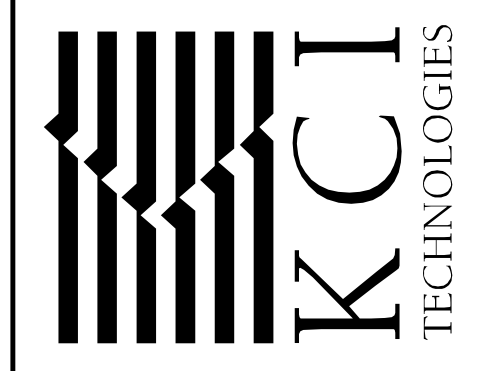
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